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O. CHARNOCK BRADLEY

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VETERINARY REVIEW

EDITOR

O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.
PRINCIPAL OF THE ROYAL (DIRK) VETERINARY COLLEGE, EDINBURGH

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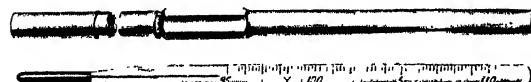
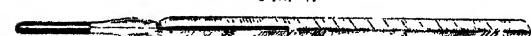


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FOREWORD.

WHEN we are told that in 1914 there were about a hundred periodicals professedly devoted to veterinary science in one form or other, we realise how impossible it was for any veterinary surgeon, however leisured, to make himself acquainted with all that was being written for his benefit and instruction. When we remember that articles of importance to veterinary science were also appearing in a multitude of periodicals not specially devoted to veterinary work, the impossibility of anyone keeping in touch with all literature appertaining to veterinary science is the more obvious.

Since the war broke out some publications have suspended issue, and many others have become inaccessible; but it is still little better than a platitude to say that veterinary science needs what most other sciences already have, namely, a publication in which some account, however imperfect, may be found of current literature of interest to the specialist and the practitioner.

The conditions of the moment are certainly not ideal for the appearance of a periodical such as is proposed, but it is possible that present difficulties may at least stimulate endeavour. It is certain that if anything moderately satisfying can be produced now, it will be an earnest of something not worse when the difficulties are removed.

O. CHARNOCK BRADLEY.

VETERINARY REVIEW.

FEEDING AND ECONOMY.

ONE of the major lessons of the present war will be that food production is really important. Not that this was not realised—by some—in peace time ; but the war has raised problems which have driven the lesson home to those who, in normal circumstances, would have given little or no thought to the matter. It has become abundantly evident that food production, *i.e.* agriculture in the wide meaning of the term, can no longer be regarded as a national affair merely ; it is inseparably wrapped up with the affairs of the Empire as a whole.

Nothing makes this clearer than does the dependence of this country upon the over-seas Empire for an adequate supply of food-stuffs for animals. If the animal population is to be other than numerically lamentable, it is obvious that food for animals must be imported. And, what is of even greater importance, it is not sufficient to supply animals with food irrespective of its economic value ; it is essential that the stock-owner should be placed in possession of knowledge respecting the best means with which to produce the best results. Herein lies the importance of those numerous feeding experiments which have been so much in evidence during the past few years. There are, doubtless, those who have persuaded themselves that feeding experiments are being overdone ; that academic questions are being pushed beyond the possibility of the practical application of the answers. Though tempting, it is really unnecessary to refute objections to the pursuit of investigations. Refutation would be easy, but possibly not worth the trouble.

Rather let it be asked—Has this country availed itself to the full of the enormous resources of the Empire?

Some answer to the question will be found in the publications which have been issued by the Imperial Institute during the past eight or ten years, and more especially during the last two and a half years. Fortunately, just before the war, the Institute inaugurated a Technical Information Bureau, the function of which was to supply information respecting raw materials. Since the outbreak of war the Bureau has been able to supply India and the Colonies with valuable information respecting new markets for raw materials which had gone almost entirely to Germany and other foreign countries. Feeding-stuffs for animals have not been neglected, and a recent publication by the Institute¹ will repay careful study. From figures which are supplied therein, many useful lessons may be learned. To take merely one example. When the German market for British copra was closed it was discovered that some difficulty stood in the way of expansion of the home manufacture of coco-nut oil, owing to the absence of a local market for the by-product, coco-nut cake. Coco-nut cake is used to a far greater extent on the Continent, and especially in Germany, than it is in this country. In 1913 Germany alone imported nearly £3,000,000 worth of copra from the British possessions, while the value imported into the United Kingdom amounted to something like £190,000 only. Can we suppose that the German import would have been so great had there not been a market for the products? And, though Germany did not consume the whole of the coco-nut cake manufactured in that country, can we doubt that the German agriculturist saw profit in the use of coco-nut cake as a feeding-stuff? *Fas est et ab hoste doceri.* The German is astute, and the British farmer may take it for granted that there is something in coco-nut cake or the Teuton would not use it so extensively.

Feeding experiments on coco-nut cake have been conducted by the South-Eastern Agricultural College, Wye; the Midland

¹ *Oil Seeds and Feeding Cakes*, Imperial Institute Monographs. London: John Murray, 1915, pp. xxiii. + 112.

Agricultural and Dairy College ; and the Edinburgh and East of Scotland College of Agriculture, with results which point to the value of both coco-nut and palm-nut cakes as feeding-stuffs, particularly for milch cows, when they are obtainable of good quality and at a suitable price.¹

If the British farmer can be convinced that there are feeding-stuffs other than those to which he is accustomed, equally good or possibly better in economic value, feeding experiments will have amply justified themselves. Not only may they help in the solution of the problem of food production ; they may also foster the mutual advantages of Imperial commerce.

Not the least important of recent investigations, from an economic point of view, are those which make fair promise to revolutionise former methods of rearing calves. It has been shown beyond dispute that the old conception of the necessity for a complicated and expensive dietary was erroneous, and that calves can be reared equally effectively on simple rations of uncooked grains and cakes, with drinking water *ad lib.*, and that milk, or any of the so-called milk substitutes, is unnecessary after the first four to six weeks of the calf's life ; so that the troublesome and costly method of feeding gruels and porridges can be considered a thing of the past : and, furthermore, calves can be satisfactorily reared at a considerably less cost than was formerly thought possible.

For the producers of pork, which is probably the most economical of foods, investigators have done much to simplify labour and increase returns, by demonstrating that the cooking of meals and cereal offals is not only unnecessary but wasteful ; and pig-feeders are the last adherents to this irrational method of feeding.

The successful dairyman, who feeds in proportion to milk yield with the best of results, is indebted in no small degree to those scientists who, by their cumulative labours, have fashioned feeding standards, the utilitarian value of which has been proved beyond question. It is true that many still refrain from availing themselves of the information at hand ;

¹ Board of Agric. and Fisheries, *Special Leaflet*, No. 20.

but that is not the fault of the scientist, but rather of the stock-keeper, and possibly of circumstances.

While feeding experimenters have done a vast amount for the food producer, the same cannot altogether be said with regard to the "worker." The horse has certainly had less attention paid to its diet than any other stock. The digestibility co-efficients and the thereon adduced "starch values," with the exception of some half-dozen food-stuffs, are based upon the results obtained on ruminants, and are therefore to a large extent conjectural as applied to the horse. Nevertheless some attention has been directed to this most important section of animal dietetics, chiefly on the Continent and in America; but it may be open to question whether the British horse-keeper has kept adequate pace with the progress of current conceptions respecting the economics of feeding.

The "oat fetish" still remains, in spite of proof that oats can be almost, if not entirely, replaced by cheaper and equally good feeding-stuffs. As Henry¹ says, "Both practical and scientific trials alike teach that other single grains or mixtures of concentrates may be substituted for oats without injury to the condition, wind, endurance, or even spirit of the horse."²

Argentine oats stood in November at 3s. 6½d. per food unit; Argentine maize at 2s. 7½d. per food unit (London).^{3,4} It has been proved beyond question that maize, suitably fed, can quite well replace a large proportion of oats for working horses, and there are other feeding-stuffs in the same category. Still, we

¹ *Feeds and Feeding*, Henry and Morrison. Madison : Wisconsin, 1916, p. 300.

² Since going to press the following has appeared in the December issue of the *Journ. of the Board of Agric.* :—

"It would appear that people who keep horses in towns are still using oats exclusively for horse corn. With the present high prices, and the urgent demand for oats for Army horses and for human food, this practice is both extravagant and unpatriotic."

³ *Journ. of the Board of Agric.*, vol. xxiii., No. 8, p. 781.

⁴ The price per food unit does not strictly apply to the horse-keeper who feeds for energy only, since the value of the nitrogenous residue obtained in the manure is reckoned in estimating the number of food units. Therefore the difference in the relative food value may not be 11d., but some other quantity.

Taking 82 and 63 as the starch equivalents for maize and oats respectively, the price per starch value (using the price per ton in London as quoted in the *Journ. of the Board of Agric.*) would be 3s. for maize and 4s. 3d. for oats, which would give an advantage of 1s. 3d. for maize instead of 11d.

find that the majority of horse-keepers persistently refuse to accept the findings of scientific experts—findings, moreover, which have been tested and not found wanting by the practical feeder—and continue to feed without any heed to national economy.

If feeding experiments have done anything they have demonstrated how economy can be practised. It is up to the stock-keeper to adopt the principles which have passed the test of practice.

Naturally the veterinary adviser of the stock-owner will be expected to be familiar with modern conceptions; and thus veterinary science has one more point of contact with national prosperity.

If it might not be translated as presumption, it would perhaps be not too much to say that the stock-owner will find it judicious to sit at the feet of the scientist.

R. G. LINTON.

ROYAL (DICK) VETERINARY COLLEGE.

ABSTRACTS.

ANATOMY

(Including Embryology and Histology).

THE LACHRYMAL GLAND. J. SUNDWALL. *Amer. Journ. Anat.* Vol. XX., No. 2. September 1916. Pp. 147-235. 20 Figures.

The paper is the result of a most thorough investigation into the minute anatomy of the lachrymal gland of the ox, and is scarcely susceptible of adequate abstraction.

The lachrymal gland of the Bovidae consists of a large *pars superior* and an appendage, the *pars inferior*. The gland really consists of six to eight compound tubular glands serially arranged and in close apposition. There are numerous goblets in the main ducts. Secretion granules are present in the epithelium of the tubules and intercalary ducts. Some of these granules stain with mucous stains, others with serous stains; but there is not sufficient evidence to prove that the gland is mixed in character of secretion. It seems more probable that the lachrymal occupies an intermediate position between the more highly specialised serous and mucous glands. Fat globules were found in the epithelium, but not more abundantly than in the submaxillary gland or pancreas. Mitochondria are abundant, but there is no evidence that they may produce secretion granules.

THE STRUCTURE OF THE THIRD, FOURTH, FIFTH, SIXTH, NINTH, ELEVENTH, AND TWELFTH CRANIAL NERVES. S. L. KOCH. *Journ. Comp. Neur.* Vol. XXVI, No. 5. October 1916. Pp. 541-552, 5 Figures.

The investigation was undertaken for the study of the presence or absence of unmyelinated fibres in certain of the cerebral nerves. The pyridine-silver method was mostly used. All the nerves were cut and mounted serially.

As a result of the investigation it was found that the fifth, sixth, ninth, eleventh, and twelfth nerves contain unmyelinated fibres. Those

in the sixth, eleventh, and twelfth nerves are probably all derived from the sympathetic system. The fibres are grouped in clusters, and are most numerous near the periphery of the nerve.

The oculo-motor and trochlear nerves are strikingly similar in composition. They are composed of large and small myelinated fibres, without any accession of unmyelinated fibres from the sympathetic system.

The abducens is similar to the third and fourth as regards its myelinated fibres, but in addition it receives a large number of unmyelinated fibres from the sympathetic.

The accessory and hypoglossal nerves are composed of large and small myelinated fibres, and are similar in structure to the third and fourth nerves. Like the sixth, they receive a considerable number of unmyelinated fibres from the sympathetic, which can be followed to the termination of the nerves in the muscles which they supply.

A SUGGESTION AS TO THE PROCESS OF OVULATION AND OVARIAN CYST FORMATION. S. S. SCHOCHEC. *Anat. Record.* Vol. X., No. 6. 20th April 1916. Pp. 447-457.

The mechanical theory of pressure atrophy (Hensen) as the cause of rupture of the Graafian follicle, and the still older theory of local necrosis due to a preformed non-vascular area (de Graaf, von Baer, His, Waldeyer) not being tenable, the author directed inquiry mainly to the question whether the liquor folliculi has a digestive action, and, if so, if it possesses a specific enzyme that can be demonstrated by dialysis or other tests.

Liquor folliculi from the ovary of the pig was used, and fibrin, connective tissue, muscle, and ovarian tissue were digested in it. The experimental technique was based on the principles of Abderhalde's dialisation reaction with Grutzner's modification.

Liquor folliculi gave a positive reaction with fibrin, fibrous connective tissue (lig. nucha), muscle, and an especially strong reaction with ovarian tissue. Amniotic fluid and normal saline, used as controls, were uniformly negative.

The conclusion arrived at is that the rupture of the Graafian follicle is due in part to the digestion of the theca folliculi by a proteolytic ferment or enzyme liberated into the liquor folliculi when the liquor reaches its maximum amount.

CLINICAL.

LOCALISED TETANUS : OXIDO-THERAPY. BELIN. *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1916. *Bull. Soc. Centr. Méd. Vét.* Pp. 203-209.

The author, after noting the occurrence of cases of localised tetanus in man during the course of the war, reports its occurrence in a horse.

The animal, while entering a stable, received a slight wound on the upper part of the forearm. This was unnoticed for several days till lameness appeared.

Examination showed a circular swelling about 6 cms. in diameter surrounding a simple punctured wound which was slightly moist. There was no general disturbance. Thinking he had abscess formation to deal with, the author prescribed warm lotions and disinfectants, and found on the following days a decided improvement. The swelling and lameness had considerably diminished.

After two days' work, however, the horse could hardly bear weight on the lame leg. There was difficulty in moving the shoulder, and the leg, from the knee downwards, swung involuntarily. There was contraction of the muscles of the forearm.

The appetite was a little less keen, but mastication and swallowing were performed in a normal manner. The temperature was 38.8° C., pulse small, respirations normal.

The swelling had nearly completely disappeared, and palpation showed neither pain nor heat.

The absence of swelling, heat, and pain, in the author's opinion, eliminated the formation of an abscess as the cause of the symptoms. Similarly, the continued appetite, normal mucous membranes, and practically normal temperature ruled out septicæmia.

On the other hand, the symptoms, including the position of the limb, were similar to those he had frequently observed in his laboratory in rabbits after inoculating tetanus bacilli into the triceps muscle, and he concluded it was a case of localised tetanus.

As a sufficient quantity of antitetanic serum was not at hand the author decided to apply the treatment which he has called oxido-therapy.

His laboratory experiments have shown that it is possible to oxidise the toxins in the body. If a rabbit which has been inoculated with a forty-eight hours' culture of tetanus bacilli in the triceps muscles, and which the second day shows contraction of these muscles, receives an injection of some oxidising substance, e.g. pot. chloras. or sod. chloras.

alone or with oxidised turpentine, he found that the limb which has remained inert during movements of the animal gradually resumes its normal position, and weight is borne on it. When the action of the oxidiser ceases contraction gradually reappears until it is as bad as at first.

The author has concluded, after studying the action of oxidising substances on infectious diseases of very different types, that soluble toxins are oxidisable in the body, and that injections of oxidising substances in numerous experimental infections enabled him to procure lengthened survival and even some recoveries. Accordingly, in his opinion, it is perfectly rational therapeutics to systematically inject such substances into infected subjects, in this way rendering the toxins innocuous and riddling the body of them, besides allowing of a more active phagocytosis. This is the method which he has called oxido-therapy.

Experimental results have been confirmed in human as well as veterinary medicine by clinical results obtained by a series of injections of various oxidising agents, *e.g.* oxygen, ozone, potassium permanganate, oxidised turpentine, etc., employed for widely different and sometimes very unexpected reasons. Such results are accounted for, provided one knows of the oxidisability of toxins in the body.

The only oxidising substance at the author's disposal was potassium permanganate, of which he made a solution about 1 in 150, and injected into the triceps muscles 50 c.c. in the morning and 40 c.c. in the evening, and each time 10 c.c. into the swelling around the wound. Next day the temperature was 39° C., conjunctiva injected, the horse remained lying, the arm was stiff and sore, but the swelling round the wound had disappeared.

On the third day the animal was much brighter, and had got up and fed during the night. The pulse was stronger, conjunctiva less injected, temperature 39·4° C.

On the fourth day the horse put some weight on his limb to get up, and hot fomentations were applied over the seat of the injections. On the seventh day weight was distinctly placed on the limb. A fairly large quantity of slightly blood-tinged creamy pus containing necrotic material was liberated from the triceps by puncture. The cavity was well washed out each day and dressed with powdered potassium permanganate (which the author has previously advised in the treatment of wounds).

Twelve days afterwards the horse walked about 35½ miles to rejoin the regiment without any particular lameness. (A. M.T.)

A NEW FORM OF LYMPHANGITIS IN ARMY HORSES. G. G. HESLOP.
Vet. Journ. Vol. LXXII. October 1916. Australian Supplement. Pp. 33-37.

The author describes a disease which he observed in five Australian remounts in Gallipoli in July 1915.

The disease was characterised in all by painful swelling of the submaxillary and neighbouring glands, a varying degree of fever ($0\cdot4^{\circ}$ to $3\cdot8^{\circ}$ F. above normal), with general depression and loss of appetite in proportion. In three cases there was lachrymation from one or both eyes, with injection of the conjunctiva, and in two cases there was also a catarrhal nasal discharge, which became more tenacious in character. In the two most severe cases, after five or six days, small nodular swellings from the size of a pea to a hazel-nut appeared along the right jugular furrow, and in one instance over the shoulder and on the outside of the jaw.

These swellings showed some tendency to become confluent, gradually increased to the size of a walnut, till, in about a week, they burst, discharging a pale amber-coloured sticky material, and leaving ulcers with an offensive odour not unlike that of "grease."

The ulcers showed little tendency to heal, and some coalesced, forming areas of fungoid-looking ulceration. One of the horses showed similar nodules on the hind legs above the tarsus, and also several small ulcers on the nasal mucous membrane.

Bacteriological examination of the discharges was unfortunately impossible. The mallein test was applied in each case with a negative result.

Epizootic lymphangitis was, in the author's opinion, ruled out because there was no evidence of a wound to provide means of infection, and there was no cording of lymphatics between the nodules.

Treatment consisted in administration of saline febrifuges and laxative food, and bathing of the eyes with boracic lotion.

In only one case was a post-mortem examination possible, and that owing to an accident nearly two months after illness. All the internal organs were healthy, and only local lesions were found.

(A. M.T.)

FIBROMA OF M. BICEPS FEMORIS IN THE HORSE (Le fibrome du long vaste chez le cheval). J. HAMOIR. *Rec. Méd. Vét.* Vol. XCII., No. 20. *Bull. Soc. Centr. Méd. Vét.* 5th October 1916. Pp. 299-301. 1 Figure.

Fibroma of the biceps muscle of the thigh is relatively rare. It may occur indifferently in all classes of horses, and develops on the

external face of the region of the femoro-tibial joint in association with the insertion of the biceps muscle to the patellar ligament. The etiology is unknown. The size of the tumour varies from that of a hazel-nut to that of an orange. In form it is more or less irregularly globular with a slight flattening. There should be no difficulty in differentiating a fibroma from cicatricial tissue resulting from a punctured wound and subsequent suppuration. In a fibroma the skin is not adherent to the tumour.

No functional interference is produced by the tumour, and it is only on aesthetic grounds that surgical interference is called for. It is recommended that the operation of enucleation should be done under local anaesthesia produced by cocaine and with the patient in the standing position. Macroscopically the excised tumour has a lobulated appearance, the lobules varying in size from that of a pea to that of a hazel-nut.

CONTAGIOUS DISEASES.

EPIZOOTIC LYMPHANGITIS IN FRANCE: DIAGNOSIS AND TREATMENT (La lymphangite épidémique en France: diagnostic et traitement). J. BRIDRÉ. *Rec. Mtd. Vet.* Vol. XCII. *Bull. Soc. Centr. Med. Vet.* 30th April 1916. Pp. 136-142. 1 Coloured Plate.

Before the outbreak of war epizootic lymphangitis was almost unknown in France. Now, however, its widespread character and the relative frequency of its occurrence have compelled the veterinary surgeons to inquire carefully into the diagnosis of the disease and the possible means of treatment. The writer of this paper recommends intravenous injection of 2 to 3 grammes of novarsenobenzol dissolved in 20 c.c. of water. If the lesions do not show indication of recession, the injection should be repeated at the end of a period of from fifteen days to three weeks. Out of nine cases—several of which were serious—the author records eight cures after one, two, or three injections.

THE BULL AS A DISSEMINATOR OF CONTAGIOUS ABORTION. F. B. HADLEY and H. LOTHE. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 2. November 1916. Pp. 143-156. 2 Tables.

The procedure in this investigation was to mate abortion-infected bulls with virgin abortion-free heifers. The agglutination and complement-fixation tests were relied upon as guides in the selection of the experimental animals. These tests, together with clinical data, were also used to interpret the results of the experiments. More reliance

was placed on the fixation than on the agglutination test, for the reason that, in the experience of the writers, it has shown itself to be in closer harmony with clinical facts. Every precaution was taken to exclude the heifers from all possible source of infection except the bulls.

The following conclusions were arrived at:—Bulls may become infected with the abortion bacilli. Bulls with systemic infections were incapable of disseminating the disease to virgin abortion-free heifers by cohabitation. Bulls appear to possess a sexual or individual immunity to abortion infection that renders them less susceptible than cows and induces a more benign form of the disease. Bulls, when infected, have the power to attenuate the infecting organisms in their bodies in a relatively short time, so that they will be safe for the service of non-infected cows. Cows usually acquire the disease from other sources than the genitalia of bulls at the time of service.

DIAGNOSIS.

PURPURA AND MALLEINISATION (Anasarque et malléation).
BRINGARD. *Rec. Méd. Vét.* Vol. XCII., No. 20. *Bull. Soc. Centr. Méd. Vét.* 30th October 1916. Pp. 302-308.

When an animal affected with purpura is subjected to the subcutaneous mallein test there are certain differential characters of the reaction. As in glanders, the injection produces extensive local oedema, pronounced prostration, and an elevation of the temperature; but in purpura one does not observe the radiating lymphatic vessels usually found about the swelling in glanders, and, moreover, the rise in temperature is never so great as in glanders. While in glanders the increase in temperature almost always attains or exceeds 2°, in purpura it is only 1·8°.

In speaking generally of the value of the intradermal palpebral method the author considers it very superior to the old subcutaneous method, and for the following reasons:—(1) Its employment is incomparably more practical and less costly; (2) the reaction is quite as reliable and much more easy to interpret; (3) it can be employed when the subject is in a febrile condition and suffering from some other ailment.

The intradermal palpebral method has been particularly serviceable in the war, for without it it would have been practically impossible to submit to the mallein test the thousands of American horses which have been passed into the French Army.

THE VALUE OF URINE EXAMINATION IN DOG AND CAT PRACTICE.
C. A. ZELL. *Amer. Journ. Vet. Med.* Vol. XI., No. 11.
November 1916. Pp. 865-870.

The author here pleads for a more extended practice of routine urine examination, especially with reference to the smaller animals. A specimen urinary report is given indicating the significance of the possible findings, and also a complete report on the urinary examination of twenty cases (dogs and cats) from which were deduced the diagnoses. The results of the post-mortem examinations on these animals clearly show that a systematic examination of the urine is a great and a trustworthy aid towards correctly diagnosing some of the ailments affecting dogs and cats.

(R. G. L.)

DIETETICS.

CALF-FEEDING EXPERIMENT WITH MILK SUBSTITUTES. J. DUNLOP and P. W. BAILEY. *Rep. Mid. Agric. and Dairy Coll.* 1916. Pp. 1-11.

The object of the experiment was to find a satisfactory and economical method of feeding calves with a minimum quantity of milk.

The milk substitutes usually recommended are too complicated for general use, therefore the aim was to find a ration which would—
(1) Form a satisfactory substitute for milk when fed with water only; (2) consist of ingredients readily obtainable by farmers at reasonable prices; (3) require little time and trouble to prepare and to feed to the calves; (4) reduce the cost of rearing as much as possible.

Twelve calves under a week old were taken and fed on whole milk for three weeks. They were then divided into three lots, and during the next three weeks were gradually brought on to the experimental rations; at six weeks old all whole milk had been stopped. The rations tried were—Lot 1, separated milk and crushed oats; Lot 2, water and mixture A, composed of linseed cake 1 part, wheat germ meal $1\frac{1}{4}$ part, and dried yeast $\frac{1}{4}$ part (by weight); Lot 3, water and mixture B, composed of linseed cake 1 part and bean meal $1\frac{1}{4}$ part (by weight). Hay was given when the calves were six weeks old. Lot 1 had separated milk at the rate of $1\frac{1}{2}$ gallon per day per calf; Lots 2 and 3 fresh cold water as much as they wanted. The rations were fed dry to all the calves.

It is shown that while all three lots made satisfactory progress the average weekly increase per calf for Lots 2 and 3 was 1 lb.

more than for those in Lot 1, while the cost of rearing was considerably less.

The calves, though not so fat, and lacking the sleek-coated appearance of whole-milk-fed calves, were in good condition and were not pot-bellied as is usually the case with gruel-fed calves.

Of the two mixtures A is slightly preferable to B.

When fourteen weeks old the calves were turned out into a covered yard and fed on linseed cake, wheat germ meal, and dried yeast with hay and green food. From six to twelve months old the calves during the winter months were fed on a mixed diet and became pleasing yearlings.

(R. G. L.)

CALF-FEEDING EXPERIMENTS. W. G. R. PATERSON and L. ROBB. *Bull. No. 68.* West of Scot. Agric. Coll. 1916. Pp. 45-60.

These experiments were carried out in 1914 and again in 1915, and were for the purpose of finding a cheap and efficient substitute for milk and to ascertain the cost of calf-rearing.

Each year sixteen calves were used, and were divided into four lots. During the first four weeks of their lives they were fed on whole milk exclusively at an average rate of $1\frac{1}{2}$ gallon per calf per day for the period. Two weeks were then allowed for the change to experimental diet to take place.

The rations tested were—(1) Whole milk; (2) separated milk and crushed oats; (3) separated milk and maize meal; (4) whey and a special calf meal. Hay was given when the calves were six weeks old, and linsced cake was added when they had reached eight weeks.

The experiments showed that on whole milk the calves had the greatest average weekly gain—13·75 lbs. per calf—but the average weekly cost of the ration was more than double that of either of the other rations, while the cost per lb. increase was 7d. as against 3½d. for Lots 2 or 3.

The calves did well on rations 2 and 3; the average live-weight gain per week in the two groups was practically the same—12·25 lbs.—and the cost per lb. live-weight increase 3·6d., the same.

The authors consider that both rations 2 and 3 are quite suitable diets for calves, and point out that starchy foods can quite well replace the fat lost to separated milk. The addition of these starchy foods widens the nitrogenous ratio of the separated milk, which is very much narrower than that of whole milk.

The whey ration was not successful, and the authors are continuing their inquiry as to its suitability.

(R. G. L.)

PIG-FEEDING EXPERIMENTS. W. G. R. PATERSON and LINDSAY ROBB.
Bull. No. 75. West of Scot. Agric. Coll. 1916. 1p. 1-12.

These experiments were conducted in 1914, and again in 1915, for the purpose of ascertaining the best method of feeding a particular ration, and to obtain accurate information as to the amount of food required to produce 1 lb. live-weight increase.

The ration used was a mixed meal, consisting of maize meal 3 parts, thirds 2 parts, and barley meal 1 part, fed along with whey at the rate of $2\frac{1}{2}$ lbs. of meal to 1 gallon of whey, the quantity varying with the age of the pigs. In the 1915 experiments a small quantity of fish meal replaced some of the mixed meal. The pigs, Large White Crosses, were weaned at eight weeks old and fed for three weeks on the mixture so as to accustom them to the diet before the actual experiment began.

In 1914 forty-eight pigs were divided into three lots and were fed as follows:—Lot 1, mixed meal fed dry and raw; Lot 2, meal soaked in whey and fed moist; and Lot 3, meal scalded with boiling water and fed moist. In 1915 the method of feeding the lots was the same, except that in Lot 2 the meal was fed dry and fish meal replaced some of the mixed meal.

The feeding time-table was as follows:—

6.45 A.M.—One-half of the daily allowance of meal, followed by one-third of the daily allowance of whey. 11 A.M.—One-third of the daily allowance of whey. 4.30 P.M.—One-half of the daily allowance of meal, followed by one-third of the daily allowance of whey.

The experiment showed decidedly that feeding meals dry and raw gives better results than if the meals are soaked and cooked. In 1914 there was an average live-weight increase per pig per week of 7 lbs. for Lot A; for Lot B, 6.66 lbs.; and for Lot C, 6.60 lbs.

Apart from this material gain there is naturally a great saving of expense and labour when the ration is not cooked.

In 1915, when fish meal replaced some of the mixed meal in Lot B and the whole was fed dry, the average weekly increase per pig was—
 Lot A, 8.8 lbs.; Lot B, 9.5 lbs.; Lot C, 8.3 lbs.

The amount of food required to produce 1 lb. gain in weight was 2.2 lbs. of meal and 8.8 lbs. of whey when raw meal and fish meal were fed, and 3.18 lbs. of meal and 12 lbs. of whey when the meal was fed scalded and moist.

The cost per lb. increase was—meals dry and raw, 3.5d.; meals dry and raw plus fish meal, 3.3d.; meals scalded, 3.7d.

The authors conclude that pigs thrive better and have a better appearance when fed on dry meals as against scalded or soaked meals. The live-weight increase is cheaper on dry than on moist feeding.

(R. G. L.)

CALF-FEEDING EXPERIMENTS. MAIZE MEAL COMPARED WITH A CALF MEAL. *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVI., No. 3. April 1916. Pp. 421-424.

The object was to test the feeding of maize meal against a calf meal composed of ground flaxseed 1 part, oatmeal 2 parts, and maize meal 2 parts. Tests were made at thirty-one centres with two lots of 121 calves in each; duration of experiment was 121 days, and the age of the calves at the commencement was six weeks. Each lot received the same weight of food, but one was fed on the calf meal and the other on maize meal.

For all the calves the meal was either boiled or steeped in boiling water, was stood for twelve hours and then fed with separated milk. A comparison of the average daily gain of the two lots showed that the mixed-meal-fed calves had a slight advantage—1·51 lb. as against 1·49 lb. for the maize-fed lot; this is practically negligible, being only 3 lbs. per head of difference for a period of 121 days. The cost of production of live-weight increase is considerably less for the maize-fed lot, being 16s. 5d. per cwt. increase compared with £1, 0s. 9d. for the mixed meal lot. Calves can therefore be successfully raised on a meal containing less oil than a "calf meal" when they are five or six weeks old, and at a less cost.

(R. G. L.)

EXPERIMENTS IN THE FEEDING OF DAIRY COWS. J. DUNLOP and P. W. BAILEY. *Rep. Mid. Agric. and Dairy Coll.* 1916. Ipp. 1-16.

Experiments were conducted for the purpose of testing hempseed cake, dried yeast, and decorticated ground-nut cake against well-known foods; the food-stuffs chosen being linseed cake, decorticated cotton meal, and decorticated cotton cake. Attention was directed to the effects of the food on the milk yield, the live weight of the cows, the percentage of fat in the milk, and the quality and flavour of the butter.

The authors found that, with hempseed cake tested against linseed cake, hempseed cake was quite suitable feeding for dairy cows, both as regards the live weight of the cows and the yield and quality of the milk. It has a slightly binding effect, rather than being laxative like linseed cake. It does not keep well in hot weather. With dried yeast versus decorticated cotton meal the dried yeast proved to be an excellent food for milk production, its comparative low percentage of oil was no drawback, neither had its bitter taste any bad effect on the quality of the milk or butter. It is one of the best keeping foods on the market. It is laxative if fed moist, but less so if given dry. Testing decorticated ground-nut cake against decorticated cotton cake the authors found that there was little difference between the two foods for milk production.

Decorticated ground-nut cake is not so binding as cotton cake, nor does it produce such hard butter; it is very palatable, and keeps better than cotton cake.

(R. G. L.)

EXPERIMENTS ON THE FEEDING OF DAIRY COWS ON PASTURE. R. A. BERRY. *Bull. No. 76.* West of Scot. Agric. Coll. 1916. Pp. 15-48.

There are farmers who think that grass in the spring and early summer months is, on the average, sufficient to ensure a full yield of milk of good quality and without causing an undue strain on the constitution of the cow, and that the addition of concentrated foods is unprofitable; they further recognise that extra food is required as the season advances, in order to make up for deficit of grass in quantity and nutritive value. Others consider that a small and increasing allowance of concentrated food is necessary throughout the grazing season for heavy milkers and newly calved cows and to prevent a "lowering" in the condition of the animals. Further, the additional food is supposed to counteract the fall in the fat content, which usually occurs when cows are turned out to pasture. Other advantages are that the land may carry more stock and directly benefit from the manurial residues of the concentrates. Opinions, therefore, differ among dairy farmers as to the advantage or otherwise of giving extra food during the grazing season.

The object of the feeding experiment was to determine what would be the effect on the milk yield of giving a small daily allowance of concentrates to cows on pasture during the summer months, beginning in the middle of July. The experiment was conducted at four centres in 1912, five in 1913, and six in 1914. A preliminary test, lasting one month, was carried out with twenty cows kept at pasture day and night and receiving no additional food. Great care was taken during this period with regard to the cows, milking, sampling and weighing milk, and estimation of butter-fat.

From these twenty animals sixteen were chosen for the experiment proper, which began in the middle of July each year and lasted for three months, but daily weighings of the milk were continued thereafter until a number of the cows were "dry." At each centre sixteen cows were divided into two lots, great care being taken in choosing the lots to minimise the degree of experimental error; this probably was small, as 224 cows were made use of. The grouping of the cows was approximately very close, and the experiment was repeated fifteen times in three years.

Both lots were treated alike, except that Lot B was allowed 2 lbs. of concentrated food daily per head for the first month and 4 lbs. during the second and third. The additional food was equal parts of decorticated cotton cake and soya-bean cake, nutted and fed dry. All

the cows were at pasture day and night. Analyses of the cakes are given, and also a table showing the results of the preliminary test. The milk yield is taken as the basis of comparison between the two lots. Possible error due to individual irregularities during the lactation period is reduced by the large number of cows used and available for the final reckoning.

The author shows in Table 3 that the concentrated food given caused a progressive increase of milk production, the increase being approximately a little under a gallon a week per head during the first month, a little less than $1\frac{1}{4}$ for the second, and nearly 2 gallons per head per week for the third month. The increase varied at each centre. Expressed in percentages (as shown in a table) the increase was 4·5, 8·5, and 15·5 on an average for each month. There was a drop in the milk yield, mainly due to advance in lactation and gestation, during the three months as follows:—Lot A (receiving no extra food), 13·5, 18·5, and 23 per cent. for each month; for Lot B (receiving extra food), 12, 15·5, and 18·5 per cent. The decrease was, therefore, more rapid with the cows having no extra food. It is shown that there was an increase of milk yield between 8 and 9 per cent. during the whole period for the cows receiving extra food. Of this amount, about 2 per cent. was obtained in the first month, 3 per cent. in the second, and 4 per cent. in the third month. Details of milk-fat percentages and the influence of extra feeding on the lactation period are given.

The author concludes from the evidence that pasture grass is insufficient, even in July, to meet the requirements of milk production. This insufficiency is more pronounced as the season advances, diminished supply and lower nutritive value of the grass being the chief cause, but probably cold nights and lower day temperature also contribute.

The author points out that though the requirements of the cow become less for milk production as the lactation period advances, as the process of gestation proceeds other demands increase. The effect of food shortage, especially during the later stages of gestation, on the health of the cow, her progeny, and on her subsequent lactation is difficult to estimate. It was the opinion of the experimenters that there was no difference in the condition of the cows of the two lots at the end of the experiment. The results at each centre, with comparisons of the grazing value of the pastures and the rainfall, are given. A table shows profit and loss, and, for convenience, the author has expressed the final average in terms of the result for one cow for the twelve weeks—total increase of milk for one cow, 177 lbs.; money value, 11s. 9d.; cost of food for production of increase, £1, 1s. 10d.; deficit, 10s. 1d. From this deficit must be deducted the manurial value of the

cakes and the value of the improvement, if any, in the condition and health of the animal. The first the author places at 7s. 4d. (on the basis of Hall and Voelcker's tables), which leaves 2s. 6d. for the supposed improvement to the cow. Cows heavy in calf would undoubtedly benefit from the extra feeding. Local circumstances would decide when and to what extent extra feeding should be adopted. A table gives the milk yields of both lots for the fourth month, and it is seen that the cows which had been cake fed maintained a lead, but not at the same rate of progress as during the previous three months. (R. G. L.)

CATTLE-FEEDING EXPERIMENTS. *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVI., No. 3. April 1916. Pp. 424-429.

(A) *With Cattle on Grass.*—The object of the experiment was to ascertain whether it is profitable to feed cake and meal to cattle which are being fattened on pasture of second-rate quality.

Two lots of cattle, 79 in each lot, were fed at fourteen centres during ninety-two days. Both lots were at grass and were changed about so that each lot received the same quality and quantity of grass. With one lot the feeding was restricted to grazing, while the other was given in addition a mixture of undecorticated cotton cake 2 parts, and maize meal 1 part; of this mixture each beast received 3 lbs. daily, increasing to 4 lbs. and finishing at 5 lbs.; the result was an average daily gain for the cake-and-meal-fed lot of 2·38 lbs. per head, for the other lot 2·08 lbs. per head. The cost of producing 1 cwt. live-weight increase for the cake-and-meal-fed lot was £1, 3s. 2d., for the others 15s. 5d.

Though the cake-fed lot had a slightly higher value at the end of the experiment, the extra cost of the cake and meal was not justified by the return.

(B) *Experiment with Stall-Fed Cattle.*—Two lots of cattle were used to test the feeding of a large quantity of roots plus a moderate quantity of concentrated food against the feeding of a small supply of roots with a larger amount of concentrates. Tests were made at thirteen centres with fifty-six cattle in each lot, and the experiment lasted 101 days. The cattle in Lot 1 were fed on 84 lbs. roots and a moderate amount of concentrated foods; Lot 2, 42 lbs. roots with 3 lbs. more of concentrated food than Lot 1. This food was composed of equal parts of decorticated cotton cake, maize meal, and crushed oats. The quantity fed was 3 lbs. per head per day for Lot 1, and 6 lbs. for Lot 2, the amount for both lots increasing proportionately as the experiment progressed; in addition, all the cattle were given a small quantity of linseed cake as fattening advanced.

There was an average daily gain of 1·93 lb. per head for Lot 1 and

of 2·03 lbs. for Lot 2; the cost of producing 1 cwt. live-weight increase was £2, 3s. 3d. for Lot 1 and £2, 5s. 2d. for Lot 2. This experiment indicates that cattle can be fattened successfully on as small a quantity of roots as 42 lbs. daily per head, and that substitution of concentrated food for turnips can be done at the rate of 1 lb. of the mixture referred to for 1 st. roots.

The advantage of reducing the quantity of roots fed applies to where roots are scarce, and not where they are plentiful.

(R. G. L.)

CATTLE-REARING. W. BRUCE. *Trans. High. and Agric. Soc., Scot.*
Vol. XXVIII. 1916. Pp. 164-180.

Cattle-rearing, at one time an important industry in Scotland, has been largely replaced by cattle-feeding. For a number of years good young cattle have been both scarce and dear, and the author fears that the knowledge of the art of cattle-rearing may be lost in Scotland: commercial cattle only are referred to, valuable pedigree stock not being considered.

The author surveys in detail the natural and artificial methods, with their various branches, of rearing calves. The diminished practice of calf-rearing is chiefly due to the prevalent idea, an erroneous one, that calves require large quantities of milk. For farmers to take up calf-rearing a minimum quantity of milk must be used, and that in a simple form; the author limits the amount to 100 gallons per calf, and by this means raises eight calves on the milk of one good cow; his method of procedure is fully described. (R. G. L.)

PIG-FEEDING EXPERIMENTS. COOKED MEALS COMPARED WITH RAW MEALS. *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVI., No. 3. April 1916. Pp. 419-421.

Experiments were carried out to compare raw meals with cooked meals as feeding for pigs, and to test the results obtained (which were in favour of raw feeding) at the Agricultural Station, Clonakilty, in 1911-1912. There were 464 pigs fed at sixty centres during a period of 102 days; the average age of the pigs at the commencement of the experiment was thirteen weeks. The meal portion only of the ration was cooked, and the procedure was to feed 232 pigs on meals which had either been boiled or steeped in boiling water, and 232 pigs on meals which were only damped or steeped in cold water. The result of this experiment, an extensive one, showed that those pigs fed on cooked meals had an average daily gain of 1·50 lb., while those on raw meals gained 1·57 lb. The experiment

fully confirms the earlier one at Clonakilty, and proves conclusively that pigs can be fattened as satisfactorily on raw meals as on cooked meals, the period of fattening is not lengthened, and no extra food is required to produce the same result. The relative cost of production of live-weight increase—for food only—was less when raw meals were fed. Reports on the quality of the pork showed it to be as good in one case as in the other. The cooking of meals for fattening pigs is apparently a needless expense, entailing a waste of fuel and labour.

(R. G. L.)

EXPERIMENT ON THE FEEDING OF PIGS. J. WYLLIE. *Bull.* No. 77.
West of Scot. Agric. Coll. 1916. Pp. 81-98.

The object of the experiment was to test the efficacy of palm-nut cake or meal as a constituent of the rations for fattening pigs, and to compare the returns from sixteen hog pigs as against those from sixteen sow pigs. Thirty-two pigs, fourteen weeks old, were chosen and fed for a week on a ration which contained some palm-nut cake; they were then divided into four lots—Lots 1 and 2 castrated males, Lots 3 and 4 unspayed sows. Lots 1 and 3 were given no palm-nut cake, while Lots 2 and 4 had a daily allowance. Though all the pigs were about the same age the males averaged 113 lbs. in weight, the females 94 lbs.

The experiment was divided into two periods—the first of sixty-three days, and the second from thirty-two to sixty days—during which time the pigs were slaughtered in batches, some being taken from each lot. During the first period Lots 1 and 3 were fed on 4 parts common thirds, 4 parts Indian meal, 1 part fish meal, 1 part “pig meal”—N. ratio, 1 : 4·6. Lots 2 and 4 were fed on 4 parts common thirds, 4 parts Indian meal, 1 part fish meal, 1 part “pig meal,” 4 parts palm-nut cake—N. ratio, 1 : 4·6. During the second period the rations were changed in order to cheapen the diet and to widen the narrow nutritive ratio. Lots 1 and 3 were now given 2 parts common thirds, 2 parts Indian meal, 4 parts flour sweepings, 1 part fish meal, 1 part “pig meal”—N. ratio, 1 : 5·4. Lots 2 and 4 now received 2 parts common thirds, 2 parts Indian meal, 4 parts flour sweepings, 1 part fish meal, 1 part “pig meal,” 4 parts palm-nut cake—N. ratio, 1 : 5·2.

The nutritive ratios are narrower all through the experiment than would have been the case had starchy foods, e.g. Indian meal and barley meal, been cheaper.

All the pigs received their food dry, the cake being merely moistened with water in order to make it more easily masticated; they were fed three times daily and had a regular supply of clean fresh drinking

water. The general health and thriftiness of the pigs throughout the experiment remained good; they were kept under good hygienic conditions, and it was remarked that very little of the litter was soiled and the pigs were particularly clean. This is attributed to the dry-feeding method.

It was shown that the pigs readily took to the palm-nut cake, which is a suitable and economical constituent of a ration for fattening pigs when used in the proportion given.

A most striking feature of the experiment was the high percentage dressed carcase weight—an average of 77·2 per cent. It is suggested that this is due to the method of dry feeding. Had the percentage been 73, which is usually considered satisfactory, there would have been a reduction of 23 st. of pork, worth £14, or 8s. 9d. per pig. The idea that a narrow N. ratio means an increase of offal percentage does not at anyrate apply in this instance. While the average daily gain in live weight per pig (1·22 lb.) is not high, the relative amount of meal required per lb. live-weight increase (4·55 lbs.) was very satisfactory.

The importance of determining the carcase weight in experiments with pigs, and especially when the price of pork is high, is clearly established. It is shown here that had the final live weight only been taken the conclusions would in some important respects have been the opposite from what they correctly are. The importance of estimating the quantity of meal required to produce unit increase in live weight is emphasised. At the same time the final test should be the quantity of meal required to produce unit increase in carcase weight. Heavier feeding may give a quicker increase in weight, but at a greater cost per lb. of increase.

"The experiment gives little support to the opinion that unspayed sows are less profitable for fattening than hogs. On the contrary, the sows gave a more profitable return per lb. of meal consumed than the hogs, and, but for the fact that they dressed a lower percentage of carcase, would also have yielded as high a nett profit."

(R. G. L.)

ECONOMY IN MEAT PRODUCTION. T. B. WOOD. *Land and Water.*
12th October 1916. Pp. 14-15. 4 Graphs.

While efforts are being directed towards the increase of home-produced food-stuffs, more attention should be given to the production of meat and dairy produce; moreover, the increase of production should be done economically. With this idea in view it has been ascertained what amount of human food is produced by a relative amount of "fodder" consumed. It is shown that to keep steers until they are two and a

half or three years old is most uneconomical, since they consume a far greater amount of "fodder" for a corresponding return of human food than do beasts of sixteen or eighteen months killed for baby beef. Calves give a still greater yield; but, since they are themselves consumers of milk—itself a product of consumption—it would be more economical to feed them on milk substitutes, and slaughter at eighteen months for baby beef. It is made plain that cows and pigs are most economical producers of human food—a cow with a good yield of milk being naturally more economical than one producing a less quantity. Eggs from good laying hens are as economically produced as is baby beef, while mutton, slaughtered at twelve months, is more so than either. The method by which these conclusions are arrived at is fully explained, and is illustrated by four graphs.

(R. G. L.)

PALM-KERNEL CAKE. C. CROWTHER. *Journ. Board of Agric.* Vol. XXIII., No. 8. November 1916. Pp. 734-749.

This article is a summary of the investigations made in the University of Leeds by various workers as to the suitability of palm-kernel cake for the feeding of cattle. The importance, on Imperial and on economic grounds, of utilising this product of our Colonies is well known; but the earlier use of this cake here by farmers left a not altogether favourable impression of its suitability. Hence the need for experimental investigation.

Palatability (H. J. Hargraves).—There is some difficulty at first in getting cattle and sheep to freely eat the cake. This is due, not to unattractive flavour or aroma, but to physical difficulties of mastication and swallowing, probably due to the grittiness of the cake. Its consumption is much slower than is the case with other cakes. The difficulty of consumption cannot be avoided by moistening the cake or by adding molasses or spices, etc., but it becomes insignificant if the cake is mixed with other foods so that it does not form more than one-third to one-half of the mixture. The cake should be introduced gradually into the rations.

Keeping Properties (W. Godden).—From tests made in the laboratory and at the farm it was found that this cake keeps very well and compares favourably with most of the oil cakes used on a farm.

Digestibility (H. E. Woodman).—Direct experiments were made on two sheep to determine the digestibility co-efficients of the nutrients in palm-kernel cake, extracted palm-kernel meal, and undecorticated cotton-seed cake. It is shown that both palm-kernel cake and meal are highly digestible, and from the data obtained it was estimated (for the samples used) that palm-kernel cake possesses 103 food units,

extracted palm-kernel meal 93·8, and undecorticated cotton-seed cake 76·2 food units. Palm-kernel meal, therefore, should be worth 23 per cent., and palm-kernel cake 35 per cent., more per ton than the cotton-seed cake.

Influence upon the Yield and Composition of Milk (A. G. Ruston).—An experiment with five cows suggests that palm-kernel cake has a specific favourable influence upon the production of milk-fat, causing an increase which was more marked in the evening milk than in the morning milk. This increase varied greatly with individual cows, and in some cases was within the range of probable error.

Influence upon the Composition of Butter-fat (H. Woodhouse)—Examination of samples of fat showed that the feeding of palm kernel cake did exercise an effect upon the composition of the milk-fat.

(R. G. L.)

INVESTIGATIONS INTO NUTRITIONAL DEFICIENCY (1. Recherches sur la carence alimentaire). E. WEILL, G. MOURIQUAND, and P. MICHEL. *C. R. Soc. Biol.* Vol. LXXIX., No. 5. 4th March 1916. Pp. 189-193. (2. Graines de cérées décortiquées.) E. WEILL and G. MOURIQUAND. *Ibid.* Pp. 194-199.

Weill and Mouriquand, having formerly shown that sterilised cereal grains when fed to pigeons caused symptoms indicating nutritional deficiency, similar to those found when decorticated grains were fed, wished to ascertain if the sterilisation of meat would produce in mammals a like result. Accordingly, they fed cats on exclusive rations of meat, raw and fresh, frozen, newly salted, cooked, freshly sterilised and old samples. All the drinking water was boiled. The results of the experiments showed that neither raw, frozen, nor recently salted (fifteen to twenty days) meat was able to cause the nervous disorders due to nutritional insufficiency. Meat sterilised, both if freshly done and if kept for a period of fourteen months, caused nervous disorders similar to those which appeared in the former experiments with pigeons. The older the sterilised meat the quicker the symptoms appeared. One can, therefore, assume that the sterilisation of meat deprives it of an enzyme which is necessary for nutrition, particularly of the nervous system.

(2) Decortication of cereals and the sterilisation of whole grain cause in pigeons identical nervous symptoms, due to the removal of "ferment substances" (vitamines); these substances are chiefly located in the cuticle. The authors wondered if the uncooked grain of decorticated cereals did not contain in the grain itself an amount of this ferment substance, or a combination of living substances, which might be capable of retarding the onset of the nervous symptoms, though not

in sufficient quantity to altogether prevent their appearance. To test this point, pigeons were fed on (a) raw decorticated cereals and on (b) decorticated cereals which had been sterilised at 120° C. for one and a half hours. It was found that pigeons fed on uncooked decorticated cereals developed nervous disturbances and died, one on the fifty-third, the other on the sixtieth day. Pigeons fed on an exclusive diet of decorticated barley sterilised at 120° C. for one and a half hours displayed the characteristic symptoms and died, one on the thirty-eighth, and the other on the forty-third day. (R. G. L.)

EVOLUTION.

EVOLUTION AND MENDELISM. R. BROOM. *Science Progress.* Vol. XI., No. 42. October 1916. Pp. 220-227.

Through their brilliant and most important work the Mendelians and cytologists have thrown much new light upon heredity, but they have not helped much to the understanding of the processes of evolution. "They have shown us some reasons why each generation resembles the previous, but they have not thrown the faintest ray of light on the problem of why it is, though there is no manifest difference between two succeeding generations, that if we take the first and last of 10,000 or 100,000 generations, the differences are very appreciable."

The work of the paleontologist has given us a fair knowledge of the evolution of the horse, the rhinoceros, the titanotherium, and other mammalian types. The paleontologist shows that the evolution was gradual. For example, fossil remains indicate that "the small low-crowned molar of the early *Hyracotherium* has, slowly and steadily through perhaps 3,000,000 years, evolved into the large complicated grinder of the modern horse." In terms of Mendelism, this was because *Hyracotherium* had in it the factor for producing a horse-like molar—a view which the author obviously cannot see his way to accept. He contends that the old views of Lamarck and Darwin may require slight amendment here and there, but they have too much established truth to be ever altogether set aside. He does not agree that the actions and habits of an animal are unable to produce changes which can be inherited. "In all the divisions of the vertebrates we have examples of increased development with increased function and reduced development with lessened function . . . and we might at first readily assume that the modification is the direct result of the function, but there are good reasons to believe that this would not be quite a correct statement of the case, for even after an organ has ceased to have any

function the rudiment still continues to decrease. . . . We may safely conclude that evolution, as we see it in the animal world, has been due to response of the organism to change in stimulation."

GENETICS AND HEREDITY.

SPOTTED ASSES. A. E. JENKS. *Journ. Hered.* Vol. VII., No. 4. April 1916. Pp. 165-168. 2 Figures.

It is rare for white spots to occur on wild specimens of domestic breeds and in wild species closely related to domestic animals. On the other hand, almost all species of domestic and pet animals show white spots. According to the writer, white spots have not been recorded as occurring in the donkey. He describes cases of white spots on a grey coat and black spots on a white coat observed by him in donkeys in Arizona, and in Naples and its neighbourhood.

The three species of mammals rarely spotted (the elephant, the dromedary, and the ass) have been much less subjected to selective breeding than the majority of domestic animals. The conclusion arrived at is, therefore, that hybridisation by selection is an important factor in the production of white spots in domestic animals.

MEDICINE.

SAND COLIC (Coliques de sables). F. FRIEZ. *Rer. Gén. Méd. Vét.* Vol. XXV., No. 298. 15th October 1916. Pp. 475-183.

Since the beginning of the war there have been many cases of colic due to the accumulation of sand in the pelvic flexure of the colon. The writer has had fifty-eight cases under his charge in three months.

Different causes have been given to explain how the sand gets into the intestine. (1) Pica, due generally to insufficient or non-nutritious food, may be a cause. (2) Feeding oats on the ground may lead to the ingestion of particles of sand and earth. (3) Muddy water is one of the most common causes. There is always a deposit of sand in watering-places, especially after rain (it was found that there might be a deposit of from 30 to 70 grammes per 10 litres of water). (4) Dusty hay containing foreign matter has also been cited as a cause.

The symptoms depend upon whether obstruction is complete or incomplete.

In *incomplete obstruction* the horse has dull and intermittent colicky pains similar to those due to impaction. A characteristic symptom is that the animal assumes a position similar to that observed during micturition, which may deceive the attendant and lead him to think that the colic is due to retention of urine. The pulse and respirations are normal. Occasionally a little sand is passed with the faeces. If treated in time the animal recovers, but often the stage of complete obstruction is reached.

In *complete obstruction* the attitude of micturition is more frequent, and is accompanied by groans. Tympany is present, especially on the right side. Respiration becomes rapid and deep, and the nostrils are very dilated. The conjunctiva is injected and the eye fixed. The pulse at first is small and wiry, but becomes imperceptible later. Rectal examination reveals a pasty mass which pits on pressure, and in which can be felt small irregular grains which suggest the presence of sand. Sometimes sand is ejected with enemata.

Some cases last about eight days, but serious cases may succumb two hours after the first symptoms are observed.

Prognosis is favourable if the obstruction is incomplete, but grave if the obstruction is complete.

Preventive treatment is as follows:—Give a hay ration. Prevent the horses from reaching the ground. Do not work beyond the food equivalent. Do not feed oats from the ground. Do not disturb the water in drinking places. When several cases of colic have occurred, give all the horses a purgative consisting of 500 grammes of sodium sulphate in 4 litres of water. Repeat this in two days' time if the amount of sand passed is not satisfactory.

The following curative treatment is suggested:—(1) In *incomplete obstruction* give 500 grammes of sodium sulphate in 4 litres of water (warm), shaken up with 1 litre of peanut oil. Ten minutes later inject 5 centigrammes of eserine. Administer every half-hour an enema of 10 litres of saline solution consisting of a handful of common salt dissolved in 10 litres of water. The enema finds its way into the small colon, and assists the action of the eserine. Generally after three or four hours of this treatment sand is passed. If the evacuations are unsatisfactory after six hours, the treatment should be continued. Massage of the intestine through the rectum is recommended.

(2) If there is *complete obstruction* give the sodium sulphate and oil as above. Through a cannula, introduce into the colon 75 grammes of sea salt dissolved in 10 litres of warm water. A douche-can is used to obtain the necessary "head" of fluid. The animal is now cast on his left side, and placed in a dorsal position with a slight inclination

towards the left. Now 5 centigrammes of eserine is injected subcutaneously, and the pelvic flexure of the colon is gently massaged through the rectum. After half an hour of this procedure the animal is allowed to rise, and is offered tepid water to drink. Oil of turpentine is rubbed on the flanks and the animal is walked about. Enemata of saline are continued. When borborygmi are heard and flatus is passed there is some chance of recovery. The sand is generally expelled two or three hours after treatment; but it may not be passed until the next day. If the evacuation of sand is not considered satisfactory, another purgative may be given the next day.

A laxative diet of grass, if possible, and bran mashes containing common salt constitutes the after-treatment.

The writer states that his method of treatment has proved very successful, and he sees no reason why it should not be of value in cases of impaction of the colon, etc.

(T. G.)

(R. E. B.)

OXALÆMIA IN DOMESTIC ANIMALS (L'oxalémie des animaux domestiques).

J. ROGER. *Rec. Méd. Vét.* Vol. XCII, Nos. 17, 18. *Bull. Soc. Centr. Méd. Vét.* 30th August to 30th September 1916. Pp. 268-278.

Under normal conditions the amount of oxalic acid in the blood is exceedingly small. In pathological states, however, the amount of acid increases considerably both in the blood and in the urine. The origin of the acid may be either exogenous or endogenous. Exogenous oxalic acid is that which has been taken in with the food, and is of little importance as compared with endogenous acid, which is produced by molecular disintegration within the organism.

In pathological conditions oxalæmia may be produced in different ways: (1) By intestinal fermentation (this view is contested); (2) by hepatic insufficiency which does not arrest the acid on its way from the intestine, or by an oxaligenous condition of the hepatic cells; (3) by a lowering of nutrition; (4) by default of elimination. These factors may be more or less combined.

The author has observed thirty cases in which oxalæmia was present in various forms. The most common condition was a muco-membranous enteritis.

The treatment suggested for oxalæmia is as follows:—Avoid oxaligenous foods. Diminish the absorption of oxalates by the administration of alkalies. Avoid fatigue. Destroy oxalic acid in the tissues by chloride of calcium or citrate of magnesia in small doses. Pilocarpin, piperazin, and purgatives are indicated.

DIABETES MELLITUS. A. E. METTAM and J. T. CRAIG. *Journ. Comp. Path. and Therap.* Vol. XXIX., No. 1. March 1916. Pp. 1-25.
9 Figures.

After a general discussion of diabetes, a detailed description is given of the disease as it occurred in an Irish terrier bitch about nine years of age. The subject presented the characteristic clinical picture. The urine was pale, with a sweetish odour, slightly acid, of specific gravity 1050, and, as shown by the fermentation test, contained 4·8 per cent. of glucose. The animal being blind and the prognosis unfavourable, she was destroyed without any form of treatment being employed. Before death the glucose in the urine had risen to 10 per cent. The blood-serum, also examined by the fermentation test, evidently contained sugar.

On post-mortem examination it was found that the liver was fatty; the gall-bladder contained small cysts in the mucous membrane; the pancreas was dead white and enlarged; the mucous membrane of the small intestine was thickened; and the kidneys were pale, large, and friable. The lens of both eyes was the seat of cataract, which, however, did not involve the capsule. The blood-plasma contained 0·39 per cent. of glucose. The red marrow was markedly deficient in granule-containing cells.

The most remarkable feature revealed by microscopic examination of the kidneys was a peculiar dilated, relaxed condition of the capillaries of the glomeruli. Liver cells, more particularly near the central vein, presented an indefinable change readily recognised but not easily described.

Naturally, a microscopic examination of the pancreas was made with considerable care, and it is interesting to learn that nowhere could islets of Langerhans be found. Otherwise the gland was normal. The cells of the gland tubules, however, were practically free from granules, suggesting that the gland was in an exhausted condition.

The cells of the cortical substance of the adrenal contained minute droplets of fat. The appearance of the hypophysis (pituitary gland) suggested great activity of the pars anterior.

PARASITOLOGY.

SARCOPTIC MANGE OF HORSES AND ITS TREATMENT (Die Sarcoptesräude der Pferde und ihre Behandlung). KNESE. *Deutsche tierärztl. Wochenschr.* Vol. XXIV., No. 21. 20th May 1916. Pp. 195.

The author suggests the following line of treatment. The horse is first clipped and the scales softened by scrubbing the skin with a

mild cresol-soap liniment. On the next day a thick covering of the following dressing is applied with a brush:—Turpentine, 1:4; linseed oil, 1:4; sulphur, 6 lbs. per 10 gallons; tartar depurat., 3 lbs. per 10 gallons.

During the next eight days the rubbing of the skin must be done with wood wool or straw; but not with a brush, as this is liable to cause discomfort. It is better to leave the dressing to come away of its own accord; but, if desired, it may be washed off with warm soapy water on the eighth day. A second dressing is only necessary in severe cases.

TREATMENT OF MANGE (Traitement de la gale). O. DESCEZEAUX, *Rec. Méd. Vét.* Vol. XCII., No. 14. *Bull. Soc. Centr. Méd. Vét.* 30th July 1916. Pp. 227-237. 1 Figure.

The treatment described necessitates the construction of a special bath (of which details are given) filled with the following dip:—

Cresyl	25 parts per 1000
Arsenious acid	1 part "
Potassium polysulphide.	6 parts "
Carbonate of sodium	10 parts "

The bath is warmed by a steam jet passing directly into the fluid, the resulting dilution amounting to about 28 gallons per day.

Affected animals are passed through the bath once every four or five days, and eight baths are said to effect a cure. In the intervals between the baths the horses are thoroughly brushed and rubbed every day.

The contents of the bath are only changed in their entirety once every three or four months. Otherwise, all that is done is to add a certain amount of fluid to replace that removed by each horse.

It is admitted that the method is susceptible of numerous improvements; but as described it has given entire satisfaction, and it is claimed that it has the merit of being simple, effective, and economical. If a bath cannot be constructed, it is suggested that mange patients should be sprayed thoroughly with the mixture.

BOVINE SARCOSPORIDIOSIS (Sur la sarcosporidiose bovine). E. E. FRANCO and I. BORGES. *Arg. Inst. Bact. Camara Pestana.* Vol. IV., No. 3. 1916. Pp. 269-289. 11 Plates (10 Coloured).

The authors have examined six cases of cattle infected with a sarcosporidian (which they place in a new genus *Besnoitia*) from the Lisbon abattoir. The lesions, in the form of spherical yellowish

granules up to 0·4 mm. in diameter, are present, especially in the superficial aponeuroses and in the subcutaneous tissue. In generalised infections they occur on all parts of the head, body, and limbs, but are most numerous on the thighs and flanks. The animals were thin, but the infection was not ascertainable by external examination of the living animal, as the cysts were not present in the epidermis.

(J. H. A.)

THE POSSIBILITY OF AMOEBOIC DYSENTERY IN THE DOG, AND ITS TREATMENT WITH EMETIN. F. WARE. *Journ. Comp. Path. and Therap.* Vol. XXIX., Part 2. June 1916. Pp. 126-130.

A pack of foxhounds kept at Ootacamund (a hill station in the Madras Presidency) had been for some years troubled with dysentery, and an examination of the faeces showed that several of the hounds were infected with amoebæ resembling *Entamoeba histolytica*. Those infected were treated with injections of emetine hydrochloride (the dose was at first $\frac{1}{2}$ grain and later 1 grain), and all, except one which died, were apparently cured by the treatment.

(J. H. A.)

ON THE LIFE-HISTORY OF *ASCARIS LUMBRICOIDES*. F. H. STEWART. *Brit. Med. Journ.* 1st July 1916. 1p. 5-7.

From experiments on pigs and rats in Hong-Kong the author concludes that the life-history of *A. lumbricoides* presents an alternation of hosts. Eggs when passed give rise to mature embryos in a damp atmosphere, preferably at a temperature of 25°-30° C. When such eggs (with embryos) reach the alimentary canal of the rat or mouse they hatch, and the larvæ enter the bodies of their host, only a few escaping in the faeces. Between four and six days after injection larvæ are found in the blood-vessels of the lungs, liver, and spleen. The host is seriously ill with symptoms of pneumonia. On the sixth day the larvæ have passed into the air-vesicles of the lung, causing haemorrhage; on the tenth day they are found only in the air-vesicles and in the bronchi. If the disease does not prove fatal the host recovers on the eleventh or twelfth day, and on the sixteenth day is free from parasites. The further course of the life-history requires elucidation, but the author points out that the transfer of the parasite from the bronchi of the rat and mouse to the intestine of man and of the pig could be readily effected. The intermediate host might readily contaminate the food of the definitive host, or the dust and earth of his surroundings.

(J. H. A.)

TRYPANOSOMIASIS IN NORTHERN UGANDA. H. L. DUKE. *Journ. Hygiene.*
Vol. XV., No. 3. September 1916. Pp. 372-387. With Map.

Miss Robertson, who had carried out investigations in the area in question, concluded that the cattle and the tsetse-flies (*Glossina morsitans*) in the fly-belt had become infected with trypanosomes as a result of a relatively recent introduction of trypanosomes, probably from the southern part of the Protectorate. Dr. Duke holds that the pathogenic trypanosomes of cattle and domestic animals (dog) in this area were originally derived from apparently harmless parasites of wild game, and cites evidence of epidemics of trypanosomiasis in cattle about 1860 and 1890. His experiments show that a trypanosome of the *brucei* group is widely distributed throughout the southern part of the northern province. Examination of 288 natives in the fly-belt did not reveal any case of trypanosomiasis, though these people must be bitten many times a day. Domestic animals cannot survive, and dogs die with keratitis and emaciation.

(J. H. A.)

THE SIGNIFICANCE OF CERTAIN NATURAL FLAGELLATES OF INSECTS IN THE EVOLUTION OF DISEASE IN VERTEBRATES. H. B. FANTHAM and A. PORTER. *Journ. Parasit.* Vol. II., No. 4. June 1916. Pp. 149-166.

Herpetomoniasis can be induced in various warm and cold-blooded vertebrates when the latter are inoculated or fed with herpetomonads occurring in the digestive tracts of various insects. The infection produced and the protozoal parasites found in the vertebrates resemble those of human and canine Leishmaniases. The disease may run an acute or a chronic course. In the acute cases among our vertebrates (mice, dogs, canaries, etc.) the flagellate form of the parasite was the more obvious at death. In chronic cases non-flagellate forms of the parasite were more numerous. We believe that Leishmaniases are invertebrate-borne herpetomoniases, and that these maladies have been evolved from the flagellates of invertebrates (especially herpetomonads of insects) which have been able to adapt themselves to life in vertebrates.

(J. H. A.)

NOTE ON A LESION OF INTESTINAL MYIASIS IN THE HORSE (Note sur une lésion de myase intestinale chez le cheval). VELU. *Rec. Méd. Vét.* Vol. XCII., No. 13. 15th July 1916. Pp. 408-410. 2 Figures.

This is a short note on a condition observed in horses in Morocco. The drought of 1913 apparently greatly increased the number of oestrids,

and it was customary to find large numbers (over 1000) of larvae in most horses subjected to post-mortem examination. In most cases no obvious ill-effects were produced. There was limited inflammation and a thickening at the bottom of the cavity in which the larvae were buried. The larvae of three species (*Gastrophilus equi*, *G. nasalis* [*veterinus*] *G. haemorrhoidalis*) were found, but the lesions in fatal cases were caused by *G. nasalis* alone.

A GRANULOMATOUS AFFECTION OF THE HORSE: HABRONEMIC GRANULOMATA (Cutaneous habronemiasis of Raillet). LIONEL B. BULL. *Journ. Comp. Path. and Therap.* Vol. XXIX., No. 3. September 1916. Pp. 187-199. 5 Figures.

Bull, working in Victoria and parts of South Australia, has encountered a disease of horses which bears some resemblance to the condition recognised elsewhere as "summer sores." The affection, which appears during the summer and autumn, is characterised by the appearance of granulomata upon the penis and sheath.

These granulomata appear suddenly, grow rapidly for a few weeks, and then subside into a slow progressive growth of, it may be, some months' duration.

Clinically these formations are recognised by their situation and granulomatous characters and, when occurring in situations where the skin is unpigmented, by the appearance of small yellowish points indicative of post-necrotic change in them. Ulceration may occur.

The size of the growths varies up to that of a walnut or sometimes larger. Their consistence is fibrous; on section their colour is greyish-pink, the surface being mottled with small, yellowish cheesy areas which are occasionally calcified.

Microscopical examination sometimes shows the presence in the granulomatous tissue of a larval nematode belonging apparently to the genus *Habronema*.

The parasites had apparently all died in the tissue before the specimen was obtained, and upon a microscopical examination some of them showed degenerative changes.

The tissue in the immediate neighbourhood of the degenerating larvae showed a proliferation of epithelioid cells, with some giant-cell formation and necrosis. A notable infiltration of eosinophile cells was present, particularly under the cutis vera.

At a later stage the centre of the necrotic patches is occupied only by broken-down material, among which it is not possible to recognise any trace of a worm.

Bull, however, considers that the histopathological picture is

sufficiently characteristic to permit of diagnosis even in the absence of the parasite.

So far as the parasite itself is concerned Bull was not able to make complete observations on account of the difficulty in obtaining material containing sufficiently early lesions. Certain observations were, however, made which appear to indicate that the parasite is an immature nematode closely resembling one of the larval stages of *Habronema muscae*.

Bull also discusses the mode of entry of the worm, which he regards as an accidental parasite, and he appears to favour the view that it is introduced into the tissues by a biting fly. With respect to prophylaxis, the destruction of infected faeces is suggested, while early complete excision of the growth is the treatment indicated. (D. C. M.)

SPIROCHÄTES AND SWINE PLAGUE (Contribution à l'étude des spirochètes des voies digestives des porcs dans leurs rapports avec la peste porcine). P. BEKENSKY. *Rec. Méd. Vet.* Vol. XCII., No. 19. 15th October 1916. Pp. 545-552.

There is no agreement among observers respecting the relationship between this disease and the occurrence of intestinal spirochaetes.

The examination of extensive material from many sources resulted in the frequent (58·7 per cent.), but not constant, discovery of spirochätes in the bodies of pigs affected with swine plague. Spirochätes were found in a certain number (17 per cent.) of living pigs in places where swine plague existed. No spirochätes were discovered in pigs suffering from "rouget" or anthrax.

Some sucking pigs were artificially infected with the ultra-visible virus, and spirochätes were discovered in almost every case (seventeen out of nineteen).

Elsewhere, pigs which had been injected with or had ingested mixed spirochäte culture, or had been in contact with these experimental animals, showed in all cases (seven) the presence of spirochätes but not typical swine plague. Spirochätes appear to cause an infection secondary to that of the ultra-visible virus. No spirochätes were found in hyper-immunised pigs. They occur in from 7 per cent. to 12 per cent. of healthy pigs. (J. P. R.)

FURTHER STUDIES ON HOG CHOLERA WITH REFERENCE TO SPIROCHÄTA HYOS. W. E. KING and R. H. DRAKE. *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 2. November 1916. Pp. 168-188. 6 Figures, 3 Tables.

Small numbers of a spirochäte, described as *Spirochäta hyos*, were demonstrated microscopically in the blood of pigs infected with cholera

Mass cultures from the blood of these animals yielded in the majority of cases a growth of spirochaetes usually contaminated. *Sp. hyos* was found in intestinal ulcers, caecal crypts, and external local lesions of infected pigs, and could be successfully filtered from suspensions containing contaminating organisms. Inoculation of the filtrates produced a disease similar to hog cholera. Under certain conditions injection of pure *Sp. hyos* culture, which had passed through several generations in artificial culture media, gave a similar result. Attenuated *Sp. hyos* cultures in some cases produced sensitisation, in other cases resistance towards subsequent injection of the filterable virus of hog cholera. Extracts from pure cultures of *Sp. hyos* had specific antigenic power in complement-fixation tests.

Other workers hold different opinions. Pigs infected with hog cholera have failed to show *Sp. hyos* in their blood. Demonstration of spirochaetes in healthy pigs, and the fact that they can be destroyed by sodium taurocholate, saponin, and lecithin, to which the hog cholera filterable virus is more resistant, points to *Sp. hyos* as a non-pathogenic organism. These and other negative results are discussed.

The discovery of a method to obtain pure cultures of *Sp. hyos* from infected blood (contrasting with the present procedure of tedious subcultivation in artificial media, with consequent attenuation of the organism) can furnish the only conclusive evidence as to the specific pathogenicity of *Sp. hyos*.

At present we must regard *Sp. hyos* as an organism present in animals infected with hog cholera, possessing certain characters suggestive of its pathogenic nature.

(J. P. R.)

THE VITAL STAINING OF MITOCHONDRIA IN *TRYPANOSOMA LEWISI* WITH JANUS GREEN. P. G. SHIPLEY. *Anat. Rec.* Vol. X., No. 6. 20th April 1916. Pp. 439-445. 8 Figures.

In 1907 Franca found granules in the cytoplasm of *Trypanosoma costatorium* and *T. rotatorium* by preagonal staining with neutral red, safranin, methylene blue, and pyronin. He was unable to obtain the same results in trypanosomes parasitic in mammals (*T. equiperdum*); but Pollicard (1910), using a somewhat different technique, was able to vitally stain granules in *T. Brucei*, *gambiense*, and *equiperdum*. He made no attempt to ascertain the chemical composition of the granules, but he believed that they were not products of the degeneration of the cytoplasm.

In 1899 Michaelis introduced the vital stain, janus green, which Bensley and others have shown to be selective for mitochondria in living cells. The writer of the present paper hoped that this dye could

throw some light on the nature and significance of the granules described by Franca and Policard.

Characteristic mitochondrial staining reactions were obtained. The kineto-nucleus, in particular, stains very brilliantly with the mitochondrial dyes, and is sharply contrasted with the surrounding cytoplasm. The conclusion that the granules are mitochondria is justified.

THE OCCURRENCE OF THE GIANT NEMATODE ON THE LIVER OF THE DOG. W. A. RILEY and W. L. CHANDLER. *Cornell Veterinarian*. Vol. VI, No. 4. October 1916. Pp. 209-212. 2 Plates, 5 Figures.

A male pointer dog, born and reared in Georgetown, South Carolina, was brought to the Laboratory of Entomology of Cornell University for fumigation with nitro-benzene for external parasites. During fumigation the animal showed certain symptoms of nervousness, and finally died. On post-mortem examination two blood-red female specimens of *Dioctophyme renale*, about 1 cm. in diameter, were found on the left lobe of the liver. The entire surface of the diaphragm was festooned with an organised exudate in which the eggs of the parasite were present.

Evidently the parasites had been long in the abdominal cavity, and had undergone much, if not all, of their development in that place. Comparatively few cases are on record of the occurrence of the parasite in the abdominal cavity. The kidneys were entirely normal, and there was no indication that they had ever been the habitat of the worms.

It has previously been noted that the presence of these worms in the dog may cause nervous disturbance and symptoms which simulate those of rabies. In the case above described the nervous disturbances were not by any means extreme, but they were clearly evident.

A NEW AND ECONOMICALLY IMPORTANT TAPEWORM—*MULTICEPS GAIGERI*—FROM THE DOG. M. C. HALL. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 2. November 1916. Pp. 214-223. 4 Figures.

The author describes in detail what he calls a new species of tape-worm of the dog—*Multiceps Gaigeri* (*Tenia G.*). Gaiger first recorded the parasite in Lahore, India, in 1907. He found in the connective tissue of two goats hydatids, which he concluded were specimens of *Cænurus serialis*, the bladderworm found in the connective tissue of rabbits. A dog fed on the cyst material and killed a month later was found to have its intestine packed with tapeworms. Two years later Dey, in Bengal, also reported the parasite; and in 1912 Southwell, in

Ceylon, reported *Cænurus serialis* from the goat and *Tænia serialis* from the dog.

In a previous paper (1910) the author provisionally accepted these findings, but has since obtained from Gaiger specimens of the hydatid and of the tapeworm, and, as stated, declares it to be a new species. The primary host is the dog and the intermediate host the goat. In the former it is found in the small intestine. In the latter it may be found in the central nervous system, liver, lungs, spleen, kidney, bladder, and connective tissue.

The locality is India (Punjab and Bengal) and Ceylon. According to the writer the species is apparently intermediate between *Cænurus cerebralis* and *Cænurus serialis*, and is interesting in that it is capable of developing in the central nervous system or in the connective tissue, thus combining the sites of the other species. He says that, morphologically, it is more closely related to the gid bladderworm, but it causes the formation of an adventitious capsule, as *C. serialis* does, and *C. cerebralis* does not, even adhering tightly to the brain, whereas *C. cerebralis* shows no trace of adhesions.

(A. M.T.)

PATHOLOGY AND BACTERIOLOGY.

LOUPING-ILL. Sir STEWART STOCKMAN. *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 3. September 1916. Pp. 244-264.

In this paper are recorded investigations made to determine the relation, if any, of ticks to the transmission of louping-ill. After some remarks on the connotations of the term "louping-ill" the writer proceeds with general considerations regarding the tick theory and the nature of tick-borne diseases. The habits of ticks found on British sheep are then considered together with the possible relation of these parasites to louping-ill. Experimental work in relation to tick transmission is then detailed, and it is concluded that the experimental evidence does not support *at present* the view that ticks transmit louping-ill.

(D. C. M.)

JOHNE'S DISEASE. THE REACTION OF ANIMALS TO "JOHNIN." Sir JOHN M'FADYEAN, A. L. SHEATHER, and J. T. EDWARDS. *Journ. Comp. Path. and Therap.* Vol. XXIX., Pts. 2 and 3. June and September 1916. Pp. 134-171 and 201-243. 13 Figures, 12 Charts.

This article is too long for adequate abstraction, and should be read in the original. The following are the conclusions arrived at by the authors:—

(1) It is possible to extract from the bodies of artificially cultivated Johne bacilli a substance which is capable of producing distinct temperature reactions in animals affected with Johne's disease.

(2) Such an extract may also have a positive result when employed by the intracutaneous method, but it appears to be capable of producing distinct reactions when applied to the conjunctiva.

(3) The extract is also capable of producing reactions in animals (young cattle) infected with human, avian, or bovine tubercle bacilli.

ON THE PATHOLOGY OF BOVINE ACTINOMYCOSIS. F. GRIFFITH. *Journ. Hyg.* Vol. XV., No. 2. January 1916. Pp. 195-207.

Attention was directed to the subject of bovine actinomycosis and its bearing on the public health by the discovery at various ports in this country of large numbers of imported ox-tongues showing evidence of actinomycotic infection.

Actinomycotic lesions in tissues from a consecutive series of forty-four oxen slaughtered in this country were examined and compared with fifty specimens imported chiefly from Argentina.

The British cases could be divided into two groups according to whether the specific granules did not or did contain Gram-staining organisms.

Group I.—The first group, characterised by the presence of granules, consisting of clubs without Gram-staining organisms, contained forty cases. The lesions were situated in the cheek, palate, tongue, or lymph-glands in relation to the mouth and pharynx. From twenty-three of the forty cases cultures of a non-Gram-staining organism were obtained, which were identical in their characters on nutrient agar plates and in shake glucose agar tubes; and five of the strains were found identical when tested on a large series of differential media. One of the cultures was inoculated into a calf, and produced a local lesion with the characters of the natural lesion.

The first group showed complete identity in the histological features and in the anatomical distribution of the disease with the actino-bacillus described by Lignières and Spitz in Argentina. The bacillus obtained had the characters of the actino-bacillus, except that the production of typical granules in the peritoneal cavity of guinea-pigs, described by Lignières and Spitz, was not demonstrated. All the imported specimens which were examined microscopically exhibited the characters of the first group, but the causal organism was not obtained in pure culture.

Group II.—The second group contained the remaining four British cases. The specific granules were composed of clubs and Gram-staining organisms, including branched filaments. The lesions were situated in

the mandible. The investigation of the biological characters of the organism concerned was still in progress when this paper was written.

These results show that actino-bacillosis is widespread in the world, and forms a considerable proportion of the cases of disease in oxen known under the name of actinomycosis.

PHARMACOLOGY AND THERAPEUTICS.

CROSS-TOLERANCE. ALTERED SUSCEPTIBILITY TO CODEIN, HEROIN, CANNABIS INDICA, AND CHLORAL HYDRATE IN DOGS HAVING AN ACQUIRED TOLERANCE FOR MORPHIN. H. B. MYERS. *Journ. Pharmacol.* Vol. VIII., No. 8. August 1916. Pp. 417-437.

It is a recognised fact that individuals addicted to the use of alcohol are more resistant to the narcotic effects of ether. This altered susceptibility is spoken of as crossed tolerance. The manner in which it is produced is not clear.

Experiments on dogs gave the following results:—

1. A marked crossed tolerance exists to codein and to heroin in dogs habituated to morphin, in so far as effects upon the respiratory centre are concerned.

2. A slight crossed tolerance exists between codein and morphin, and between heroin and morphin, in regard to their actions upon the tissues governing equilibrium.

3. Dogs tolerant to morphin when given codein or heroin have increased intestinal peristalsis.

4. No evidence of crossed tolerance to cannabis indica or to chloral hydrate exists in dogs tolerant to large amounts of morphin.

5. The experiments cited show that a cross-tolerance may exist between closely related drugs, but that this tolerance is evidenced only on those functions in which the drugs have a common selective action.

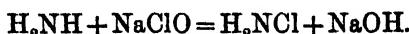
THE ANTISEPTIC ACTION OF SUBSTANCES OF THE CHLORAMIN GROUP.

H. D. DAKIN, J. B. COHEN, M. DAUFRESNE and J. KENYON. *Proc. Roy. Soc.* Vol. LXXXIX., B., No. 614. 6th May 1916. Pp. 232-251.

While experimenting with antiseptics suitable for the treatment of infected wounds, one of the authors introduced a modification of the ordinary sodium hypochlorite solution, which was found to be very useful. Although a powerful germicide, it does not coagulate blood-serum or other proteins, yet it dissolves necrotic tissue. It is freely soluble, fairly penetrating, and practically non-irritant at a strength of 0·5 per cent.

The fact that of a large number of antiseptics examined the hypochlorites seemed to be about the most generally useful, led to the investigation of their mode of action in order to find, if possible, any related substance of greater practical value.

Raschig showed many years ago that when a hypochlorite solution is added to ammonia the simplest chloramin, viz. NH_2Cl , is formed, thus—



A great variety of organic substances containing NH groups react with hypochlorites to form compounds of the chloramin group, *i.e.* substances containing the NCl radical. The writers consider it is probable that the germicidal action of hypochlorites is due to similar chemical changes brought about directly or indirectly by the antiseptic in some of the compounds of the living cell, especially the proteins, and that these changes may also take place in the extra-cellular proteins. At least part of such action on proteins consists in the replacement of the hydrogen of some of the NH groups by chlorin, forming substances of the chloramin group, and the bactericidal action of the hypochlorites appears to depend on their ability to effect this change. As indirect evidence of this the authors state that free chlorin, bromin, and iodin do not differ widely in germicidal power, but when the halogen is converted into hypochlorite or hypobromite there is a marked difference. Hypochlorites have a germicidal power similar to free chlorin, while the action of hypobromites is about 1 per cent. that of free bromine, and the unstable hypo-iodite has practically no such activity. They state that the feeble action of the two latter may be related to their sluggishness in reacting with proteins as compared with hypochlorites. The probability that the formation from proteins of substances containing the NCl radical had something to do with the germicidal action of the hypochlorites led the authors to make a systematic investigation of a large number of substances containing the NCl group.

An exhaustive series of bacteriological tests were made with various organisms, chiefly with *staphylococcus aureus*. Two tests were made—one in which the organisms were suspended in water, the other in fluid to which 50 per cent. horse serum had been added, and the minimal concentration of the antiseptics under review, capable of killing the organisms in water or serum in two hours at laboratory temperature, was ascertained.

Almost all of the substances examined containing the NCl group were found to possess very strong germicidal action, in many cases molecule for molecule greater than that of sodium hypochlorite.

P-toluene sodium sulphochloramide was found to be as good as any and has been successfully used. It is comparatively non-irritant, and can

be used where other efficient germicides would prove too irritating. It is readily made from a cheap by-product in the manufacture of saccharin, and is sold under the name chloramin-T. by several British firms. Another advantage is its stability in solution. In the dark it was found that decomposition was inappreciable after 132 days, while in solutions exposed to light for the same time the loss of strength was trivial. P-toluene sodium sulphochloramide should not be left long in contact with steel instruments as it attacks the metal. (A. M'T.)

ON THE PERIPHERAL ACTION OF THE OPIUM ALKALOIDS. EFFECT ON
THE SENSORY NERVE TERMINALS. D. I. MACHT, S. L. JOHNSON,
and H. J. BALLINGER. *Journ. Pharmacol.* Vol. VIII., No. 8.
August 1916. Pp. 451-463.

The authors state that the general opinion amongst modern pharmacologists is that opium has no local effect on sensory nerve terminals, but by a series of experiments they have shown this belief to be unjustified. These experiments proved that various alkaloids of opium applied locally to skin or mucous membrane exerted a distinct effect on the nerve terminals in the following order, viz. papaverin, narcotin, morphin, narcein, codein, and thebain.

Further, it was noted that a mixture of the total alkaloids (pantopium or pantopon) exerts a similar effect in greater degree than the amount of morphin or papaverin which it contains would do if applied alone. This seems to show that the different alkaloids contained in opium potentiate each other. The authors consider that the local effect of opium, as noted in their investigations, justifies its oftentimes empirical use by clinicians past and present. (A. M'T.)

INTRAVENOUS INJECTION OF SOLUTIONS OF PHENOL AND GUIACOL IN
STRANGLES, PURPURA, AND CONTAGIOUS PNEUMONIA (Solutions
phéniquées et gaïacolées en injections intraveineuses contre la
gourme, l'anasarque, la pneumonie contagieuse). PORET. *Rec.
Méd. Vét.* Vol. XCII., Nos. 17, 18. *Bull. Soc. Centr. Méd. Vét.*
30th August to 30th September 1916. Pp. 261-267.

Details of a number of cases are given. The author evidently prefers guaiacol to phenol. Guaiacol is four times more active than phenol and less toxic. The dose by the mouth is from 5 to 10 grammes for the horse, and from 5 to 15 grammes for the ox.

In none of the horses to which guaiacol was given intravenously was there any symptom of poisoning. All that could be noticed was a little somnolence during the injection, and often for a few moments afterwards.

In intravenous injections guaiacol is more tractable than phenol, and should it, by mistake, find its way under the skin or beyond the vein, no inflammatory result is produced. Guaiacol does not give rise to the muscular trembling which is produced by the first injections of phenol.

THE ANTAGONISM BETWEEN ATROPIN AND CERTAIN CENTRAL EMETICS.

C. EGGLESTON. *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 11-25. 3 Tables, 1 Chart.

As the result of experimentation on dogs, the following conclusions were arrived at :—

1. Atropin and hyoscyamin are capable of antagonising the vomiting produced in dogs by central emetics—pilocarpin and nicotin—and are incapable of antagonising that of other central emetics—morphin, apomorphin, aconitin, emetin, and ouabain.

2. The antagonism of atropin and hyoscyamin towards the emetic action of pilocarpin and nicotin is not of a chemical nature, but is physiological, and takes place upon the centre.

3. The observations suggest a complexity of the vomiting centre, including at least two different points of action, or sets of receptors, for chemical stimuli. The one is stimulated by pilocarpin and nicotin, and depressed by atropin: the other is stimulated by morphin, etc., but not by pilocarpin and nicotin, and is not depressed by atropin.

(A. M.T.)

THE ELIMINATION OF STRYCHNIN BY THE KIDNEYS. R. A. HATCHER and

M. I. SMITH. *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 27-41. 2 Tables.

Investigation showed that strychnin appears in the urine of dogs within a few minutes after administration, but only in the merest traces. There is a sharp distinction between this prompt appearance of mere traces and the rapid elimination that accompanies excessive diuresis. In every one of the seventeen dogs in which diuresis was actively induced the strychnin was eliminated at a relatively rapid rate by the kidneys; but in none of the fourteen experiments in which the amount of strychnin exceeded the average fatal dose by 20 per cent. or more was the elimination by the kidneys alone sufficient to save the animal's life. It is possible that diuresis may contribute to the successful therapeutic treatment in those cases where the amount of strychnin taken is only slightly in excess of the minimal lethal dose, but it must play a minor *rôle* in the treatment.

of poisoning where very large doses have been taken. In such cases artificial respiration and general anaesthesia with ether and chloroform must continue to be our chief reliance.

(A. M'T.)

PHYSIOLOGY (Including Physiological Chemistry).

THE INFLUENCE OF THE ADRENALS ON THE KIDNEYS. E. K. MARSHALL, Jr.
and DAVID M. DAVIS. *Journ. Pharmacol.* Vol. VIII., No. 9.
September 1916. Pp. 525-550.

In sixteen cats both adrenals were removed at intervals of from three to twelve weeks. The animals lived from one to seven days after the second adrenal had been removed. The onset of serious symptoms was often comparatively sudden, occurring from twenty-four hours to a few minutes before death.

The urea concentration in the blood rose to about twice the normal, and then remained stationary at this level until shortly before death, when it again rose. Phenolsulphonephthalein was injected intramuscularly. Its excretion showed a tendency to diminish after the removal of the adrenals.

When urea and creatinin were ejected into cats from which both adrenals had been removed the excretion of these substances in the urine was much less than in normal animals or those from which only one adrenal had been removed.

The normal histological structure of the kidney was not altered in adrenalectomised animals unless they had received an injection of urea, creatinin, or sodium chloride.

The nitrogen excretion in the urine was slightly diminished, but this is accounted for by the retention of nitrogen products. There was, therefore, no evidence of change in protein catabolism, although there was evidence of a marked lowering of kidney efficiency, which occurred with a normal blood-pressure and when the animals were in excellent physical health.

The experiments seem to show that the adrenals produce some substance which is necessary for the maintenance of normal kidney function.

THE BIOCHEMICAL COMPOSITION OF SEMEN (Sur la composition biochimique du liquide spermatique). B. SLOVTZOV. *C. R. Soc. Biol.* Vol. LXXIX, No. 5. 4th March 1916. P. 208.

A chemical analysis was made of the semen of the dog and horse, and the following percentages were discovered:—

			Dog.	Horse.
Water	.	.	97.560	95.705
Solids	.	.	2.450	4.295
Ash	.	.	0.687	0.915
Organic matter	.	.	1.763	3.380
Total albuminoids	.	.	1.259	2.238
Albumins, globulins, nucleo-proteins	.	.	0.886	1.142
Mucin	.	.	0.057	0.559
Albumoses	.	.	0.314	0.537
Lipoids	.	.	0.182	0.172
Cholesterin	.	.	0.00075	0.0042
Various organic matter	.	.	0.312	1.090
Δ	.	.	0.603	0.557

The conclusions arrived at were—

1. The composition of semen differs in different animals.
2. The amount of solids and proteins show particularly clear variations.
3. In the semen of the dog and horse there is a certain quantity of albumoid matter of the type of albumose.
4. The semen of the horse is particularly rich in protein.
5. Spermin was not found in the semen.

RECENT ADVANCES IN OUR KNOWLEDGE OF THE ACTIVE CONSTITUENT
IN THE THYROID: ITS CHEMICAL NATURE AND FUNCTION.
E. C. KENDAL. *Boston Med. and Surg. Journ.* Vol. CLXXV.,
No. 16. October 1916. Pp. 557-562. 16 Figures.

In 1914 the author reported that he had isolated from the thyroid a crystalline compound containing 60 per cent. of iodin. Since that time, though more than a ton of thyroid was used, crystals were only isolated twice until recently, when it was discovered that the presence of carbon dioxide is necessary. Apparently the substance does not exist in a free form in the thyroid secretion, but is firmly locked up in a protein molecule. Experimentation with the substance (alpha-iodin) on animals has given results briefly indicated in the present paper. There appears to be no other substance in the thyroid secretion which acts directly. Alpha-iodin, given even in small amounts, will supplant thyroid activity, relieving the symptoms of myxœdema and cretinism, and in excess will produce symptoms simulating those of exophthalmic goitre. It appears to have no direct action on the pulse-rate.

THE PHYSIOLOGICAL WORK OF IVAN PETROVICH PAVLOV. W. M. BAYLISS.
Brit. Med. Journ. No. 2919. 9th December 1916. Pp. 799-800.

Professor Bayliss gives a short general summary of the highly important investigations conducted by Pavlov on the processes of digestion.

Pavlov's early work was concerned with the functions of the digestive glands and the manner in which their activity is excited and co-ordinated. It was due to his work that knowledge was gained of the way in which activity of the glands in one part prepares the next following part of the alimentary canal for the due treatment of the food when it arrives. For example, the passage of acid chyme from the stomach into the duodenum stimulates the production of pancreatic juice, and the pancreatic juice in one part of the small intestine causes the secretion of succus entericus in the succeeding portion of the gut.

Other investigations by Pavlov dealt with the relation of external phenomena and the reaction of the organism to them. As an example may be quoted the fact that when food is presented to a dog a reflex secretion of saliva is produced. If a bell be rung simultaneously with the presentation of the food for a number of times, the sound of the bell alone becomes sufficient to produce the reflex secretion. Especially interesting were Pavlov's investigations of cases into which the time-element enters. If a flash of light is followed regularly by the presentation of food at an interval of ten seconds, the flash of light of itself becomes sufficient to excite the secretion of saliva, but not until an interval of ten seconds has elapsed from the time of the flash of light.

Unfortunately, much of Pavlov's work, being in Russian, is somewhat inaccessible; but it is hoped that before long an account of it in English may be published.

SEROLOGY AND IMMUNOLOGY.

A COMPARISON OF THE "DEFIBRINATION" AND "OXALATE" METHOD OF SERUM PREPARATION AS APPLIED TO HÆMORRHAGIC SEPTICÆMIA AND ANTHRAX SERA, TOGETHER WITH SOME ANALYSES OF BUFFALO AND HILL BULL BLOOD. ROLAND V. NORRIS. *Bull. No. 60. Agric. Research Institute, Pusa.* 1916. Pp. 1-15. 20 Tables.

An account is given of experiments on the preparation of haemorrhagic septicæmia and anthrax sera by two different methods, the chief object being to study the influence of the method on the yield and quantity of the serum.

In the "defibrination" method the blood is drawn into bottles containing a coil of copper wire, defibrinated by shaking, and the defibrinated blood then centrifugalised. The advantages of the method are great simplicity and rapidity. The serum, however, is usually of a bad colour from the presence of an appreciable amount of hæmoglobin. On

carbolisation a considerable deposit settles out and becomes extremely dark on standing.

In the "oxalate" method the blood is drawn into bottles containing a small quantity of potassium oxalate in solution, the latter being used at the rate of 10 c.c. of a 10 per cent. solution to every litre of blood. The bottle is rotated to secure thorough mixing and the blood is then allowed to stand.

The experiments have led to the following conclusions:—

1. In the preparation of haemorrhagic septicæmia and anthrax sera the oxalate method gives a considerably increased yield of serum as compared with the defibrination method.

2. The serum prepared by the oxalate method is greatly superior in appearance to that obtained by defibrination and centrifugalisation.

3. In the case of buffalo blood the oxalate method saves 50 per cent. of the centrifugalising, as the corpuscles settle rapidly and the plasma can be syphoned off. This point is of considerable practical importance where large quantities of sera are dealt with as the consequent economy in engine power entails an appreciable saving of expense.

4. With hill bull blood the corpuscles show little tendency to settle, and the whole of the blood has to be centrifugalised as in the defibrination method.

5. In both haemorrhagic septicæmia and anthrax bleedings, if a series of bleedings be taken at short intervals, the yield of serum increases progressively, the third bleeding giving a larger percentage of serum than the second, which in turn yields more than the first.

6. Analyses of normal buffalo and hill bull blood show that the serum from the latter animal contains a considerably larger percentage of globulins than does that from buffaloes. This seems to be the chief point of difference between the two bloods.

ON THE ACTION UPON TETANIC WOUNDS OF DESICCATED ANTITETANIC SERUM TO WHICH SUBGALLATE OF BISMUTH HAS BEEN ADDED
(De l'action sur les plaies tétaniques du sérum antitétanique desséché, additioné de sous-gallate de bismuth). MÉRIEUX.
C. R. Soc. Biol. Vol. LXXIX., No. 5. 4th March 1916.
 Pp. 199-201.

Experiments were undertaken in order to study the action, on tetanic wounds, of—(1) antitetanic serum alone; (2) an antiseptic alone; (3) a mixture of serum and antiseptic.

The author found that the local application of a mixture of dried antitetanic serum and subgallate of bismuth, applied six hours after the contamination of the wound, prevented development of tetanus in

the guinea-pig; while the application of antitetanic serum alone had to be made within an hour of contamination if the same result was to be produced. He presumes that the bismuth in the mixture paralysed the organisms and consequently favoured phagocytosis.

THE RESULTS OF THE USE OF HOG-CHOLERA GLOBULIN ON THREE THOUSAND HOGS IN THE FIELD. R. GRAHAM. *Amer. Journ. Vet. Med.* Vol. XI., No. 9. September 1916. Pp. 703-707. 8 Tables.

The apparent advantage of globulin over serum (blood minus fibrin) has been pointed out by Reichel. The Kentucky Experiment Station desired further information regarding the merits of globulin, particularly the results to be obtained under field conditions, where its protective powers might be observed in different outbreaks. Laboratory tests had demonstrated that serum could be chemically treated and concentrated without influencing the potency of the product. In the observations herein described, the field conditions, including feeding and housing methods on different farms, represented favourable as well as unfavourable surroundings.

The tests led to the following conclusions:—The globulin possesses immunising properties equal to that of whole unrefined serum. It protects against natural exposure and artificial infection (1 to 5 c.c. virus) in 0·2 c.c. per pound weight. It may be used in smaller doses than the unrefined serum owing to its concentration. In this way it offers the advantage of reducing the labour of administration. It seems reasonable to assume that a small immunising dose is absorbed more rapidly, as the units of value are more quickly available. Globulin is a sterile product, which affords an additional advantage over unrefined serum.

OBSERVATIONS ON TWO THOUSAND EIGHT HUNDRED PIGS INOCULATED WITH HOG-CHOLERA VIRUS. H. P. HOSKINS. *Journ. Amer. Vet. Med. Assoc.* Vol. XLIX., No. 6. September 1916. Pp. 817-829. 8 Tables, 1 Chart.

Of the 2800 pigs inoculated 390 (13·9 per cent.) failed to succumb to the infection. Failure to succumb means that the pig either did not die, or did not at any time become sick enough to warrant slaughter for the purpose of obtaining virulent blood. The reactions following injections of virus varied between the two extremes possible, namely, from no reaction that was noticeable up to death in as short a time as five or six days. No pigs survived a temperature higher than 107·4° F. Pigs appear to be most susceptible during the period between weaning

time and when they reach about fifty pounds in weight. Virus pigs will usually show the height of their reaction at or about the sixth or seventh day. For some unexplained reason the pigs which failed to succumb reached the height of their reaction a day earlier, on the average, than those which died or were killed. With certain restrictions attached to the meaning of the term "fixed virus" such a virus may be obtained by the frequent passage through susceptible pigs, the number of such pigs being large enough to allow a considerable choice in selecting the seed virus pig from each group.

SKIN DISEASES.

A PECULIAR SKIN DISEASE OF CATTLE IN NORTH-WESTERN RHODESIA.

J. M. ARMFIELD. *Vet. Journ.* Vol. LXXII., No. 495. September 1916. Pp. 308-310.

The author records the occurrence of a troublesome disease of the skin of cattle over one year old. The disease appears first on the thin parts of the skin—about the thighs and udder, beneath the elbows, and on the muzzle—but may in bad cases cover practically the whole of the skin. Rough grey villous-looking growths, about the size of a pea, are seen, and if one is pulled off a hollow in the skin is left. There is no evidence of pruritus. So far no specific cause has been discovered, but by some the bout tick (*Amblyomma hebraicum*) is blamed. Experimental transmission of the disease has not been possible, and although some observers claim that it spreads gradually from one to another, this is not the author's experience.

With regard to treatment, bad cases are incurable, but less severe ones may be at least improved by the application of a warm solution of sulphurated calcium. This is left on for three days, then washed off and applied again if necessary. Frequent dipping in an arsenical solution is also useful, and some owners state that such dipping prevents the occurrence of the disease.

In the opinion of the author it is possible that a poverty-stricken condition of the cattle may play some part in the causation of the disease.
(A. M.T.)

TREFOIL DERMATITIS. S. DODD. *Journ. Comp. Path. and Therap.* 'Vol. XXIX., No. 1. March 1916. Pp. 47-62.

A dermatitis, accompanied by exudation and irritation, affecting the domestic herbivora of certain parts of New South Wales, has been known for many years by the name of "aphis disease," a name given

to the disease by stock-owners under the assumption that it is caused by aphides. The disease is observed principally in the spring (August, September, and October), when trefoil is green and abundant.

Experiments were conducted to discover the connection of the disease with trefoil. Guinea-pigs fed upon an exclusive diet of trefoil, and exposed at the same time to direct sunlight, suffered from an erythema and inflammatory oedema of the skin. Only unpigmented skin was affected, and, apparently, when such skin is protected from the sun even it may escape. The condition produced in the guinea-pig was in all respects similar to the disease affecting sheep, horses, and cattle, which leads to the conclusion that the so-called "aphis disease" is not due to aphides, but to feeding mainly or exclusively on the common trefoil (*Medicago denticulata*). The factors necessary to the production of the dermatitis are—(1) The food must consist entirely or mainly of trefoil; (2) the animal must possess unpigmented skin; (3) such unpigmented skin must be exposed to the direct action of the sun's rays.

The paper concludes with an account of other conditions similar to that of trefoil dermatitis.

SURGERY.

THE SPECIFIC SERUM TREATMENT OF WOUNDS (Le traitement sérique spécifique des plaies). E. LECLAINCHE and H. VALLEE. *Rev. Gén. Méd. Vét.* Vol. XXV., No. 295. 15th July 1916. Pp. 306-316.

Extensive trials of the polyvalent serum obtained from hyper-immunised horses have been made both in the laboratory and in the field. The results are distinctly encouraging. The limitations and disadvantages of antiseptics on infected wounds are well known, especially their unfavourable action on the cellular defences. The essential feature of the phagocytosis, as explained by Metchnikoff, is an intraleucocytic digestion of the invading organisms. Hence to a specific invasion must be opposed a corresponding specific defence. Nevertheless, the problem of finding a substance toxic for the microbe alone is far from being completely solved. Both chemicals and normal serum have given indifferent results.

The immunising substances elaborated in another animal produce active serums which confer great resistive power against corresponding pathogenic microbes when applied directly to the sick animal. The latter exhibits local and general actions simultaneously. The authors'

object is to determine experimentally if infected surfaces respond to serum therapy, and whether the method can be applied to the systematic treatment of wounds. The serum is prepared in the usual way, as large a number as possible of microbic species being collected from the wounds. The application of the specific serum to an infected wound is followed by marked effects; profuse suppuration ceases after one or two dressings; normal horse serum is negative.

The results are satisfactory where the microbic flora of the treated wound correspond to the specific qualities of the serum used. A serum is, naturally, only effective in the presence of species which have been used in its preparation.

Failures are largely due to this fact, the multiplicity of species and varieties of the microbes, and also to the mistaken practice of applying antiseptics to the wound prior to the serum dressings. The use of an antiseptic is contra-indicated. A favourable serum dressing does not sterilise the wound. It excites an intense phagocytosis, especially when it comes in contact with all the anatomical elements, fixed and migratory, and when it is frequently and regularly applied. From the first dressing it produces more marked exudation, and the wound is rapidly cleansed. At the same time the serum, by neutralising the endotoxins of the microbes entering into its composition, contributes to the defence and preservation of the cellular elements of the tissue.

To the local changes is added, as a rule, a corresponding improvement in the general phenomena. The fact that the serum must come into direct contact with the injured tissues is emphasised. This is effected by means of surface dressings, soaked tents, and injections. Operative treatment, such as the removal of foreign bodies and dead tissue, is also carried out. Two varieties of the same serum are now in use. The one suitable for local application; the other, obtained from highly immunised animals, is reserved for intravenous and hypodermic medication. The latter combats the infectious phenomena accompanying large traumatisms.

Anaphylaxis need not be feared, provided the serum is not employed in cerebral surgery.

The facts to hand clearly establish that polyvalent serum is a valuable agent in the struggle against infection. (A. W.)

THE TREATMENT OF WOUNDS WITH SUGAR (*Le traitement des plaies par le sucre*). ALBERT LHOSTE. *Rev. Path. Comp.* No. 125. July 1916. Pp. 22-24.

Many substances have long been used in the healing of wounds, including sugar. It is a cheap and easily procurable antiseptic, applied

in the form of a powder directly to the wound, or enclosed between layers of aseptic gauze. Concentrated sugary solutions are also employed, or solutions of sodium chloride saturated with sugar.

The wound may be washed, shaved, and mechanically cleansed with normal saline; it is covered with sugar and a dressing, and redressed at intervals of five days. The substitution of saline solution saturated with sugar appears to accelerate the healing process. Good results are shown by the absence of suppuration and the early appearance of healthy granulations. Saccharose, lactose, glucose, or ordinary crystallised sugar are equally beneficial. Preliminary disinfection with permanganate of potassium and other agents, as well as operative procedures, may be indicated. The history of the treatment shows that the technique may be varied with advantage. Thus iodoform may be added to the powdered sugar. A watery sugary solution, containing the chlorides of magnesium and sodium, has also been employed. For ulcerous lymphangitis, and presumably for other specific or septic ulcers and wounds, the author recommends copious irrigation with the latter solution before the powdered sugar is applied.

But experiments on a much more extensive scale are required in order to establish the efficacy of the treatment. (A. W.)

TERATOLOGY.

ANOMALY OF THE HEART OF A DOG (Anomalie du cœur chez le chien).

G. MOUSSU. *Rec. Méd. Vét.* Vol. CXII., Nos. 15, 16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 466-470. 2 Figures.

The dog had been destroyed because he had become disagreeable. There was no history of any pathological condition. On the exterior of the heart there was a deep depression on the anterior surface midway between the base and the apex. A single arterial trunk left the base of the heart; no pulmonary artery could be found. The aorta was normal, except that, on a level with the bifurcation of the trachea, it gave off a large branch to the lungs.

On examining the interior the two atria (auricles) were found to communicate by way of a large foramen ovale. The left ventricle was normal. Anatomically the right ventricle also existed, but could not be considered to have any physiological function whatever. The opening between the right atrium and the right ventricle would only admit a knitting-needle.

It was evident that venous blood from the right atrium would be com-

elled to pass through the large foramen ovale into the left atrium and there mix with the purified blood returned from the lungs by the pulmonary veins. The mixed blood would be transmitted to the left ventricle, and thence circulated throughout the body.

THE ANATOMY OF A THREE-LEGGED KITTEN. W. B. KIRKHAM and H. W. HAGGARD. *Anat. Record.* Vol. X., No. 8. 20th June 1916. Pp. 537-542. 3 Figures.

The subject of this note was an ordinary tiger-striped female kitten, the mother of which had previously given birth to normal offspring. The kitten was one of a litter of three of which the other two were normal.

The left scapula possessed no coracoid process. The left humerus had no lesser tuberosity, and tapered rapidly from the epiphyseal groove to end in a point about where the deltoid tuberosity should have been.

The pectoral and latissimus dorsi muscles formed a continuous sheet. There was no biceps or coraco-brachial muscle. A mass of muscle fibres was wrapped round the tapering part of the humerus from the level of the insertion of the pectorals and deltoid to near the tip. The radial, musculo-cutaneous, median, and ulnar nerves terminated in this mass.

TOXICOLOGY.

LARKSPUR POISONING OF LIVE STOCK. C. DWIGHT MARSH, A. B. CLAWSON, and HADLEIGH MARSH. *Bull. No. 365.* U.S.A. Dept. Agric. 8th September 1916. Pp. 1-90. 15 Plates, 5 Text-Figures, 11 Tables, 7 Charts.

A summary of the more important publications, with especial reference to the poisoning of domestic animals by larkspur, introduces the paper. From this review it appears that there is little definite evidence that domestic animals in Europe or Asia have been poisoned by larkspur. It is in North America that practically all the losses of domestic animals have occurred. The delphiniums contain a poisonous alkaloid, similar in its action to aconitin. The poison is a local irritant, causing strong convulsions. Its systematic action is on the nervous system, depressing the respiratory and vasomotor centres. The immediate cause of death is asphyxiation. The only method of detecting poisoning by larkspur is by microscopic examination of the contents of the rumen: sections of stems of delphinium can be distinguished from other plants.

Though there was definite evidence of heavy animal losses due to larkspur poisoning, it appeared necessary to determine at what time of the year and under what conditions these plants are poisonous; whether the tall and low larkspurs are equally dangerous; to determine in greater detail the symptoms and pathological results of the poison; and to consider what possible remedial measures could be taken to lessen the losses.

Experimental work was carried on for three seasons at two stations—at Mount Carbon, Ohio, and at Greycliffe, Montana—and the effects of feeding animals with delphinium of different varieties are described.

The experimental work resulted in confirmation of the opinion that larkspur is poisonous to cattle. Horses may be poisoned by larkspur, but do not voluntarily eat sufficient to do them harm. The definite conclusion was reached, after feeding experiments with different species of larkspur, that it has no poisonous effect on sheep.

Poisoning by the low larkspurs is confined to the months of May and June: it disappears in July. The tall larkspurs are most poisonous in their early stages; most cases occur in May and June, but may occur up to September.

No marked difference in the toxicity of the different species of larkspur was noted. The quantity required to produce ill-effects varied between wide limits, but a quantity at least equal to 3 per cent. of the weight of the animal was necessary to produce poisoning. The best results were obtained by using as antidotes—hypodermically— injections of physostigmin salicylate, pilocarpin hydrochloride, and strychnin sulphate.

(G. H. G.)

EXPERIMENTAL MITOCHONDRIAL CHANGES IN THE PANCREAS IN PHOSPHORUS POISONING. W. J. M. SCOTT. *Amer. Journ. Anat.* Vol. XX., No. 2. September 1916. Pp. 237-253. 1 Plate, 7 Figures.

Several contributions have been made of late years on the mitochondrial changes in phosphorus poisoning. Mitochondria in the epithelium of the pancreas are normally filamentous and possess bleb-like swellings. In phosphorus poisoning the blebs first disappear, and the mitochondria become shorter and thicker. This occurs before there is any other visible change in the cells.

In the second stage the mitochondria tend to clump together; nextly, they fuse and lose their individuality.

In severe cases of poisoning the mitochondria become rounded droplets, possibly lipoid.

(M. D.)

POISONING IN CATTLE BY FEEDING ON MEAL FROM SOYA BEAN AFTER EXTRACTION OF THE OIL. Sir S. STOCKMAN. *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 2. June 1916. Pp. 95-107.

It was reported to the Board of Agriculture that a number of cows had died from an obscure disease. At least sixty-seven cows were obviously affected on nine different farms, of which number fifty-four died and thirteen recovered.

The outstanding symptoms were—The presence of blood trickling from the nostrils, congestion of and haemorrhage from the visible mucous membranes, temperature 105° to 109° F., with the usual febrile symptoms. The dung, at first normal, later contained blood-clots and blood-stained mucus. Abdominal pain was indicated by the animals paddling with their feet and kicking at the abdomen. There were subcutaneous haemorrhages resulting in swellings ranging in size from that of an egg to that of a child's head. Haemorrhage, when it occurred into the muscles of a limb, caused lameness, and when into the region of the throat it interfered with swallowing. The cows died suddenly or from progressive weakness, and when recovery took place an improvement was noted at about the third day. Three cows died one day after the first definite symptoms were noticed; of the others, the majority died between the second and eighth day, while one lived for seventeen days and then succumbed. It is interesting to note that, on the farms, only milking cows were affected; neither bull, heifer, yearling, calf, two-year-old, sheep nor pig showed any illness.

The post-mortem findings were—Haemorrhage into the tissues and organs. Lungs pale, with pleura showing patchy haemorrhages. There was localised peritonitis causing loops of the bowel to become adherent. The stomach and the intestines showed haemorrhages on the mucous membrane, and in the region of Peyer's patches there were lesions resembling the haemorrhagic ulcers of cattle plague and of East Coast fever. The abdominal lymphatic glands were haemorrhagic, but the liver, spleen, and kidneys showed no marked alterations.

Inoculations and bacteriological examinations discounted cattle plague, East Coast fever, haemorrhagic septicæmia, or anthrax as a possible cause of the illness. The absence of bracken excluded bracken poisoning.

The cows had been turned out for a short time daily, and had received a mixed diet, which included about 3 lbs. of extracted soya-bean cake or meal. The owners of the affected animals were at one in suspecting that the soya meal or cake was responsible for the illness.

Soya beans, soya cake, and soya meal have hitherto proved themselves safe and valuable food-stuffs. The solvent used for the extrac-

tion of the oil, leaving a residual meal, has commonly been naphtha; some time ago, however, this was replaced by trichlorethylene.

Consignments of the meal and cake taken from the farms on which cattle were affected were forwarded to the Board's laboratory for investigation, and five heifers were fed therewith.

The symptoms and the lesions found on post-mortem examination were identical in the experimental animals and the farm cattle.

Inquiry brought out that poisoning from soya meal began at the time that trichlorethylene replaced naphtha as the solvent used for the extraction of the oil from the bean, and that, though steam at 400° F. was used to remove the solvent from the meal, a trace of it remained which might, by accumulation in the body, become toxic; this was negatived by feeding a heifer during a period of thirty-nine days with a total of 117 ozs. of trichlorethylene. Single large doses also had no ill-effect.

It is curious to note that illness did not appear until the meal had been fed for a period ranging from eight (?) to seventy-one days, and that with the experimental animals the shortest time was twenty-nine days; also that in 65 per cent. of the affected animals on the farms illness did not appear until from two to twenty-eight days after feeding of the meal had been discontinued. "This points to the poison being one which takes some time to act although a poisonous dose is present in the system. It might also mean that the actual poison is manufactured inside the animal by a slow process from extracted soya."

The smallest amount of the cake eaten at the laboratory before ill-effects were apparent was 172 lbs. No species of animal other than cattle was affected either at the laboratory or on the farms.

The high temperature of the affected animals excluded the probability of ordinary poisons, but not a poison of the ricin class; no castor seeds, however, were found in the meal.

The fact that the animals received a mixed diet eliminated the possibility of the scurvy type of disease.

The exact nature of the poisonous substance is not yet known. "Trichlorethylene itself, however, is not poisonous when given to cattle in comparatively large doses—1 to 3 ozs., and for long periods. It may be (*a*) that the products from trichlorethylene obtained by heat are poisonous (this is doubtful); (*b*) that the trichlorethylene in contact with the soya and heat used to drive off the former forms a poison; or (*c*) that some of the trichlorethylene was impure and contained other bodies."

Extracted soya meal constitutes an excellent auxiliary food-stuff for cattle, but it is inadvisable to use trichlorethylene as the extractor.

(R. G. L.)

TUBERCULOSIS.

TRANSMISSION OF TUBERCULOSIS FROM THE PIG TO MAN. REINOCULATION INTO A CALF (Transmission de la tuberculose porcine à l'homme. Réinoculation au veau). H. MARKUS. *Rev. Gén. Méd. Vét.* Vol. XXV., No. 298. 15th October 1916. Pp. 466-478. 3 Figures.

A veterinary surgeon received infection of the thumb from handling tubercular pork. The skin of the thumb and the axillary glands were involved. The lesion on the thumb and the glands of the axilla were removed surgically, and guinea-pigs were injected with an emulsion of the caseous material from the gland. One guinea-pig lived one hundred and fourteen days, and then died; a second animal was killed on the one hundred and fifteenth day after injection. Both animals were affected with generalised tuberculosis. Cultures were attempted from the spleen pulp of the two guinea-pigs, but the media remained sterile. Another guinea-pig was inoculated with the tubercular spleen pulp of the animal which was killed on the one hundred and fifteenth day after injection of the human material. This animal developed generalised tuberculosis in forty days. Three successive cultures were made from the spleen. Tertiary culture, suspended in sterile water, was injected under the skin of the right side of the neck of a calf. The calf died fifty-three days after inoculation, and post-mortem examination revealed widespread tuberculosis.

A CASE OF CASEOUS PNEUMONIA OF RESPIRATORY ORIGIN IN THE PIG (Sur un cas de pneumonie caséuse porcine d'origine respiratoire ; considérations relative à la pathogenie et à la pathologie comparée). P. CHAUSSÉ. *Rec. Méd. Vét.* Vol. XCII., Nos. 15, 16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 445-460. 3 Figures.

A case is recorded in a well-nourished female pig about six months old. In the right lung there was a massive caseous lesion involving all the anterior and part of basal and cardiac lobes. The latter also exhibited small tubercles surrounded by a broncho-pneumonia. The left lung contained a partly caseous lesion in its anterior portion. The pleura over the right lung presented fragile fibrous adhesions, vegetations and fibro-caseous tubercles, isolated or confluent. The pulmonary glands were greatly enlarged and caseous. The mesenteric glands contained two small foci. Lymph-glands associated with the liver were much hypertrophied and caseo-calcareous. Liver, spleen, and lung parenchyma contained numerous minute tubercles.

The author summarises the process of the development of the caseous pneumonia as follows:—A fibrous and desquamative broncho-pneumonia; elementary tubercles; caseous tubercles with persistence of intermediary broncho-pneumonia; enlargement of tubercles with broncho-pneumonia still persisting; and, finally, caseous pneumonia due to fusion of tubercles.

He based his diagnosis and pathological conclusions on the local and lymphatic reaction. Lesions always predominate at the point of inoculation. Infection in spontaneous tuberculosis is always characterised by a primary peripheral focus (in this case the anterior lobe of right lung), by a caseation of lymph-glands (pulmonary glands), and generalisation by centripetal lymph-flow leading to the venous junction, and hence to lung (the small tubercles in parenchyma), liver, and spleen. The disease of the mesenteric glands he regards as due probably to the swallowing of mucus, or to generalisation by the blood-stream. The large lesion of the left lung, he thinks, arose from mucus which had passed from the gross lesion of the other lung to the bifurcation of the trachea, and hence to the left lung.

The absence of lesions in the tonsils and submaxillary glands and the position of the initial lesion point to infection by inhalation.

It is claimed that this is the first case of gross caseous pneumonia to be recorded in the pig. Previous investigations have shown that 90 per cent. of cases of porcine tuberculosis are infected near the buccal or staphyline tonsil, bacilli travelling by the superior cervical or maxillary lymph-glands to gain the venous circulation and the body in general. In only 3 per cent. or 4 per cent. of cases can infection be assigned to inhalation, when air infected by bovines is the probable source. The rarity of infection by inhalation the author attributes (1) to the duration of a pig's life, usually lasting only six or eight months, in which time the disease does not become pronounced and infection of other swine take place; (2) to the nature of the pig's surroundings, which are generally moist, unfavourable to formation of dust, and thus to inhalation infection; and (3) to the special liability of the pig to infection by milk and offal.

(J. P. R.)

THE COMBINED AND FOLLOW-UP SYSTEMS OF TUBERCULIN TESTING.

G. H. HART. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 2.
November 1916. Pp. 189-208. 3 Tables.

The fact that any of the methods of tuberculin test will fail in a noticeable percentage of cases has been demonstrated; and it has further been established that tuberculous animals, while giving negative results to one form of the test may give positive reactions to another

form. The value of combining two or more tests is apparent, and no herd should be accredited as free from tuberculin reactors unless a combination of tests has been performed; and then only after such a test is followed up by a further test six weeks later upon all non-reacting cattle. The value of the follow-up test is to detect animals in the incubation stage, or those which are insensitive to tuberculin for other reasons at the time of the previous test. No special combination of tests is recommended, but it seems that the ophthalmic, either sensitised or secondary, together with an intradermal injection, making a record of temperature reactions resulting from such injections, is a very satisfactory combination, since with this combination all three forms of tuberculin reaction will be brought into play with the least danger of making the animals tuberculin insensitive or immune.

An extensive bibliography is given.

REPORTS.

ANNUAL REPORT FOR THE YEAR 1915. DIRECTOR OF VETERINARY SERVICE (W. LITTLEWOOD), MINISTRY OF AGRICULTURE, EGYPT. Cairo: Government Press. 1916. Pp. vi.+59.

A gangrenous disease, bearing some resemblance to black quarter, has been observed several times affecting the muscular masses of Sudanese cattle. The exudate was found to contain a small bacillus in almost pure culture. It showed bipolar staining, and was easily cultivated by anaerobic methods. The disease was transmissible both by wound inoculation of the exudate and by inoculation of artificial cultures. The natural infection is frequently caused by wounds inflicted by the horns of other cattle.

In former years the occurrence of a sarcosporidiosis in the buffalo, ox, sheep, goat, camel, and pig has been recorded. On two occasions during the year under report sarcospores have been found free in the blood of cattle which have died under suspicion of anthrax.

"Tropical ulcer" affects imported equines not of Syrian or Arabian origin, and appears to be confined to Abbassia and its immediate neighbourhood. The lesion, which may be single or multiple, is a rapidly forming ulcer, with a raised indurated base, varying in size from 1 to 3 ins. in diameter. Smears made from the deep part of the indurated tissue have shown the presence of a small bipolar bacillus in large numbers. The disease has been reproduced by the subcutaneous injection of a culture into the horse.

In 1914 a new form of piroplasmosis was reported as occurring in Sudanese sheep, the organism being a *Theileria* and not a *Babesia*. Recent observations have shown that a similar disease occurs in Egyptian sheep. The causal organism, as seen in the red blood corpuscles, resembles that of East Coast fever, but is even more minute. The spleen in the disease is enlarged to three or four times its normal size. The kidneys contain white infarcts. The stomach shows linear congestion, and the intestines some degree of patchy inflammation. Schizonts (Koch's blue bodies) are present in the spleen, glands, and infarcts.

The report contains a "Note on spraying of cattle with special dips for the eradication of ticks" (H. Cooper).

**ANNUAL REPORT OF THE CIVIL VETERINARY DEPARTMENT, BIHAR AND
ORISSA, FOR THE YEAR 1915-16.** D. QUINLAN, M.R.C.V.S.
Patna: Bihar and Orissa Government Press. 1916. Pp.
8+xvi. 8d.

As in previous years constant attention has been given to the reporting of outbreaks of the scheduled contagious diseases, and although the improvement recorded in 1915 has been largely maintained, serious outbreaks of cattle disease in which large numbers of animals die still remain unreported. Various reasons may be suggested for this state of affairs. The principal cause appears to be the pressure which is brought to bear on the chaukidars by villagers, particularly Hindus, to prevent them from giving any information concerning diseases, more especially rinderpest, as it is not looked on by local Hindus as a disease at all but as a goddess, who is supposed to take up her abode in affected animals during the period of their illness. The appearance of rinderpest in a village is not, on this account, therefore, regarded as an evil, but as a piece of good fortune, and such being the case, they look on any form of treatment, whether by medicine or inoculation, as interfering with the deity. Under such conditions one can readily imagine that information about outbreaks is rigidly suppressed, and that in spite of the efforts made by the Police and the Veterinary Department many cattle die about which no information is available at all. During the year 3527 outbreaks were reported against 3882 in 1914-15. It is satisfactory to note that in some instances members of the co-operative societies have reported outbreaks of their own accord.

Although the usual propaganda of distributing pamphlets, giving demonstrations and lectures in villages where outbreaks occurred, seeking advice and help of the district officials and leading zamindars, and endeavouring to induce members of co-operative societies to lend their assistance, was carried on throughout the province, still there has been a considerable reduction in the number of animals protected against disease, as there were only 98,144 cattle immunised in 1915-16 as compared with 130,027 in 1914-15, a decline of 31,883. One of the principal reasons for this reduction has been the opposition encountered in certain districts on the part of the Hindu cattle-owners. In many cases prejudice was so strong that the veterinary assistants were in danger of being assaulted, and, even when the cattle were actually dying, owners would accept no sort of treatment.

The remarks contained in last year's report on the value of serum as a protective agency when used with a certain amount of intelligence are further strengthened by this year's experience.

The number of animals treated by itinerant veterinary assistants on tour rose from 53,613 in 1914-15 to 54,904 during the year under

review. There was an increase from twenty to twenty-three in the number of hospitals for in-patients open during the year.

The Government cattle-breeding farm at Sipaya continues to make satisfactory progress, and the strength of the herd now stands at 204 as against the 51 animals with which it was started in 1914. The condition and general health of the cattle are reported to have been good. The number of requisitions for bulls is increasing, and it will be a long time before it will be possible to comply with all the applications received.

**REPORT ON THE WORKING OF THE VETERINARY DEPARTMENT OF THE
RANGOON MUNICIPALITY FOR THE YEAR 1915-16.** L. S.
SEDGWICK, M.R.C.V.S. Rangoon: British Burma Press.
1916. Pp. 31.

A notable reduction in the number of cases of glanders is reported; but it seems that, unfortunately, the Rangoon gharrywallah is becoming wise in an undesirable direction, for, when he discovers that his animal shows clinical symptoms of the disease, he removes the animal out of the Rangoon boundary in order to evade detection. During the year under review 1001 animals have been tested for glanders, and of these only 1·59 per cent. have proved positive reactors, as against 4·79 per cent. in 1914-15, 3·91 per cent. in 1913-14, 6·5 per cent. in 1912-13, and 14·9 per cent. in 1911-12.

Though only three cases of epizootic lymphangitis were reported during the year it is evident that more of this disease exists in Rangoon than is generally recognised, because, as in the case of glanders, ponies affected are removed outside the Rangoon boundary until such time as the disease is less noticeable.

In 770 cases of tuberculosis discovered on inspection of carcases in the slaughter-house at Pazundaung, the following were the organs most commonly affected:—Lungs (371), liver (142), head (114), intestines (73).

**DEPARTMENT OF AGRICULTURE, CANADA. REPORT OF THE VETERINARY
DIRECTOR-GENERAL (F. TORRANCE, B.A., D.V.S.) FOR THE YEAR
ENDING 31ST MARCH 1915.** Ottawa: J. de L. Taché. 1916.
Pp. 131. 7 Plates. 10 cents.

The Veterinary Director-General reports that the year 1914-15 was marked by the occurrence in the United States of the most severe outbreak of foot-and-mouth disease in the history of that country. This naturally gave rise to alarm in Canada, but, prompt measures

being adopted to exclude all dangerous carriers of infection and to surround the traffic in other less dangerous commodities with all the safeguards that prudence could suggest, it is gratifying to note that no case of the disease was found in Canada.

A further reduction in the number of cases of glanders is reported. The majority of cases which have occurred have been in the provinces of Saskatchewan and Alberta, where the influx of new settlers attracts the horse-dealer to supply the necessary horses for tilling the soil. These horses are often brought long distances by train, and exposed to the most favourable conditions for the spread of the disease should it happen to be present.

Hog cholera has continued to give much trouble and anxiety, and has caused serious losses in the districts in which it appears. Farmers are apt to put off the notification of the disease until several animals have been lost, and by this time the disease has usually invaded neighbouring herds, making its eradication difficult and expensive. The practice of feeding garbage is responsible for many outbreaks.

Dourine has occupied the attention of the staff in Southern Alberta. In Appendix No. 14 is given a very full account of "Dourine and the Complement-Fixation Test," in which the writer meets certain objections to the use of the test.

In writing of tuberculosis the Director-General points out that if cattle-owners were alive to their own interests they would take steps to protect themselves against the constant drain of this disease by cleaning up their herds and keeping them clean. The Health of Animals Branch of the Department of Agriculture has many herds under its control in which the disease has been got rid of and kept out, and this work could be extended immensely if owners desired it.

The problem of dealing with bovine tuberculosis is not an easy one. Its very immensity deters the pioneer in legislation, who feels that the ordinary methods of dealing with contagious diseases would be of no avail against an infection so widely disseminated. Added to this is the knowledge that the average farmer is not asking to have the disease eradicated, and would probably resent any method of dealing with it that would cost him anything.

After much careful consideration of the whole subject it was decided to attack the disease at the point where it is most dangerous to the human race. An attempt would be made to prevent the sale of tuberculous milk in cities and towns and to ensure that the milk supply should be derived solely from cows that had passed the tuberculin test. In order to secure the co-operation and goodwill of the citizens to this work it was decided to apply it only to such cities and towns as made a request for it and were already licensing dairies and keeping them up to a certain standard of cleanliness and sanitation. Provision was made for dealing with reactors in a liberal way, so as to minimise the loss to the owner as much as possible.

FOURTH REPORT OF THE BOARD OF AGRICULTURE FOR SCOTLAND, BEING
FOR THE YEAR ENDED 31ST DECEMBER 1915. Glasgow: James
Hedderwick & Sons. 1916. Pp. lix.+7. 3½d.

The Board gave assistance in the investigation of "scrapie," "louping-ill," and "yellows" in sheep.

The number of stallions registered in 1914-15 again shows an increase as compared with the previous registration year. This appears to be due not only to the fact that the purpose of the scheme is becoming better known, but also to the fact that stallion-owners are realising the added value which attaches to a horse in respect of which a fresh certificate of soundness and suitability for breeding purposes can be shown from year to year. Thirty-eight stallions which were examined for registration were adversely reported on by the veterinary surgeons appointed by the Board, and the stallion-owners appealed against the rejection of their horses in five cases. In only one instance, however, was the appeal sustained by the referee appointed for the purpose.

During the year assistance in the breeding of cattle was given to small farmers—(a) By supplying bulls, the property of the Board; and (b) by paying premiums to approved societies and committees, which arranged for the provision of suitable bulls for service at a moderate rate. Sheep-breeding was assisted in a similar manner.

The Board are gratified to be able to report that their scheme for the encouragement of pig-breeding has met with much more success during the past season than in previous years.

REPORT OF PRACTITIONER'S SHORT COURSE IN VETERINARY MEDICINE.
Vol. I., No. 1. Pp. 1-253. 110 Figures. *Official Publication of
Iowa State College of Agriculture and Mechanic Arts.* Vol. XIV.,
No. 36. 10th May 1916.

This report contains the following papers:—"The Clinical Examination of Animals" (Bolton, R. R.); "Wound Infection and Wound Pathology" (Udall, D. H.); "Colic in the Horse" (Udall, D. H.); "Surgical Anatomy of the Anterior Part of the Head, including a Preliminary Study of the Teeth and Sinuses of the Horse" (Murphy, H. S.); "Diseases of the Head of the Horse" (Bemis, H. E.); "Mode of Action of Drugs" (Bergman, H. D.); "Food Inspection" (M'Farlin, J. W.); "Breeding Problems" (Bergman, H. D.); "Sterility in Cows" (Bemis, H. E.); "Foot-and-Mouth Disease" (Stange, C. H.); "Wound Infection" (Murray, C.).

The papers on the teeth and sinuses of the horse are profusely illustrated. A chart is given illustrating the prevalence of foot-and-mouth disease in Prussia during the years 1910, 1911, 1912, and

1913, which is interesting as showing the effect of the modification of quarantine regulations operating in 1911.

AGRICULTURAL RETURNS FOR SCOTLAND, 1916. MEMORANDUM ISSUED
BY THE BOARD OF AGRICULTURE FOR SCOTLAND. September 1916.

A preliminary statement is made of the number of live-stock in Scotland, compiled from returns collected on the 5th June, and a comparison is made with 1915.

The live-stock returns show increases in the total numbers of horses and cattle, and decreases in the numbers of sheep and pigs. Horses of all classes are more numerous than last year ; those used for agricultural purposes have increased by 4383, or 3·4 per cent., unbroken horses by 3657, or 8 per cent., and other horses by 369, or 1·5 per cent., the total increase amounting to 8409, or 4·2 per cent. Cattle show a slight nett increase of 1397, or 0·1 per cent., the decreases in the numbers of cows and calves being outweighed by the increases in the other classes. Cows in milk are fewer by 7113, or 2 per cent., cows in calf by 2311, or 5·3 per cent., and cattle under one year by 2729, or 1·1 per cent., while heifers in calf have increased by 524, or 1·2 per cent., and other cattle of one year and upwards by 13,026, or 2·5 per cent. Breeding ewes are more numerous by 10,038, or 0·3 per cent., and other sheep of one year and above by 34,382, or 2·8 per cent., but lambs are fewer by 73,301, or 2·6 per cent., so that the total number of sheep shows a diminution of 28,881, or 0·4 per cent. Sows for breeding have increased by 436, or 2·5 per cent., but other pigs have been reduced in number by 12,908, or 9·1 per cent., the nett decrease thus amounting to 12,472, or 7·8 per cent.

REVIEWS.

THE MILK PROBLEM IN INDIAN CITIES, WITH SPECIAL REFERENCE TO BOMBAY. By L. L. JOSHI, B.Sc., M.D., with a Foreword by JOHN A. TURNER, C.I.E., M.D., D.P.H. Bombay : D. B. Taraporevala, Sons & Co. 1916. Pp. 232.

Judging from the foreword written by Dr. Turner, executive health officer of the Bombay municipality, the milk supply of large towns in India is, to put it mildly, very unsatisfactory. He says that the milk is collected by agencies and stored in dirty hovels, contained in brass vessels which are scrubbed with mud obtained from unsavoury sources, and sent long distances in open cans with a wisp of dirty straw to prevent spilling.

Dr. Joshi reviews the whole of the source and distribution of the milk supply of Indian cities. He gives plates illustrating the various breeds of cattle and of the byres in which they are kept. Milk from various sources has been chemically analysed, and certain milk standards are proposed. The various factors affecting the composition and purity of milk are considered, and economic, sanitary, and legislative measures are discussed.

The book should be in the hands of all those whose duties are concerned in the supply of milk to Indian cities.

THE ESSENTIALS OF HISTOLOGY. By Sir EDWARD A. SCHÄFER, M.D., Sc.D., LL.D., F.R.S. Tenth Edition. 1916. London : Longmans, Green & Co. Pp. 563. 720 Figures.

There can be little doubt that the future development of veterinary education will depend largely upon the amount of attention which is devoted to the fundamental subjects of the curriculum. Clearly the superstructure can scarcely be expected to be satisfactory and enduring, or susceptible of elaboration, unless the foundations are well and truly laid. No subject with which the junior student is concerned could well be more important than that of normal structure. It is a commonplace to say that without a sound knowledge of microscopic anatomy the student is severely handicapped in all his subsequent laboratory work.

The absence in the English language of a book dealing with the histology of the domestic animals is much to be deplored, and especially so by the teacher, whose work is thereby enormously increased. Fortunately, however, the gap is partly filled by several good publications intended primarily for the use of the medical student. Probably Schäfer's *Histology* is the best known of these, and deservedly so. Seeing that this book has already passed

through nine editions since 1885, it is superfluous to subject the new issue to detailed review. There are undoubted improvements in it, and among these, though of minor importance, may be noted an alteration in the shade of colour employed in printing some of the illustrations. The present edition is somewhat larger than the last; and many new illustrations, mainly photographs of microscopic preparations, have been added.

(O. C. B.)

FEEDS AND FEEDING. A HANDBOOK FOR THE STUDENT AND STOCKMAN.

By W. A. HENRY, D.Sc., D.Agr., and F. B. MORRISON, B.S.
Sixteenth Edition. 1916. Madison, Wis.: Henry Morrison Co.
Pp. 691. 11s.

This book, first published in 1898, is now in its sixteenth edition. That the fifteenth issue, printed at the end of 1915, ran out in four months speaks for the popularity and value of the book. The contents are divided into three sections dealing with plant growth and animal nutrition, feeding-stuffs, and the feeding of farm animals; there is also an appendix giving tables of the composition of American food-stuffs, the digestibility of food-stuffs, feeding standards, and other information. Every branch of animal feeding is here dealt with, and the results of all the important investigations into animal nutrition are given to date and placed before the reader in a condensed form, together with the practical results obtained in the farming industry. The practice of inserting in the text references to other paragraphs dealing with the subject under discussion is of great service to the reader.

A chapter is devoted to a review of the various feeding standards, which are concisely explained. To the British veterinarian, accustomed to arranging rations on the basis of Kellner's starch equivalents, the Wolff-Lehmann standards (modified by the authors in view of recent investigations) may be at first confusing. Since agricultural conditions and the values of certain food-stuffs differ from those in this country some of the text will be of little immediate value to the British practitioner. Nevertheless, every veterinarian would find much useful information in this book were he to add it to his library.

(R. G. L.)

NOTES ON BOOKS.

INFECTION AND IMMUNITY: A TEXT-BOOK OF IMMUNOLOGY AND SEROLOGY FOR STUDENTS AND PRACTITIONERS. By C. E. SIMON, B.A., M.D. Third Edition, Revised and Enlarged. London: Baillière, Tindall & Cox. 1916. Pp. 361. 12 Plates, 21 Figures. 14s.

Professor Simon's book is intended for the medical practitioner and student working at clinical pathology, but it will be useful to veterinary practitioners who wish to know the current views on, and methods employed in, those sections of their work which have come to be known by the unpleasing names of "immunology" and "serology." A critical review of a book which has already gone through two editions is scarcely called for, as it is clear that it has justified its inclusion in current scientific literature.

THE ART OF ANESTHESIA. By P. J. FLAGG, M.D. London and Philadelphia: J. B. Lippincott Co. 1916. Pp. 341. 15s.

In several ways the author has treated his subject in an original manner. One scarcely expects to see the portraits of Homer and Shakespeare in a work of this kind, but there is, doubtless, interest attached to their inclusion. The author divides general anaesthesia into two classes—complete and incomplete. In complete anaesthesia three stages are recognised—induction, maintenance, and recovery. In incomplete anaesthesia there are only two stages—induction and recovery.

MEDICAL AND VETERINARY ENTOMOLOGY: A TEXT-BOOK FOR USE IN SCHOOLS AND COLLEGES, AS WELL AS A HANDBOOK FOR THE USE OF PHYSICIANS, VETERINARIANS, AND PUBLIC HEALTH OFFICIALS. By W. B. HERMS. New York: The Macmillan Company. 1915. Pp. xii. + 393. 228 Figures. 17s. nett.

PHYSIOLOGICAL CHEMISTRY: A TEXT-BOOK AND MANUAL FOR STUDENTS. By A. P. MATHEWS, Ph.D. London: Baillière, Tindall & Cox. 1916. Pp. 1050. 76 Figures. 21s.

Though described in the title as a text-book for students, this is an underestimation of the public to which this book will appeal. From its scope it is even more likely to find its chief user in the advanced worker.

The first part of the book is probably the more important, since it deals with fundamentals, such as the chemistry of protoplasm and the cell, carbohydrates, lipins, and proteins. In the chapter on glands which produce an internal secretion the author suggests the name of "cryptorhetic organs," because "they are the tissues of hidden flowing." It may be doubted if this new name will meet with general acceptance; but in the case of terminology it is never safe to prophesy.

A PRACTICAL GUIDE TO X-RAYS, ELECTRO-THERAPEUTICS, AND RADIUM THERAPY FOR STUDENTS AND PRACTITIONERS. By A. E. WALTER, M.R.C.S., L.R.C.P., Major, I.M.S. Calcutta and Simla: Thacker, Spink & Co. 1916. Pp. 263. 144 Figures. 10s. 6d.

An elementary treatise in which the main facts of the subject have been compressed into small space. It is clearly intended for those who are approaching the subject for the first time, and will doubtless serve this purpose admirably.

THE ESSENTIALS OF CHEMICAL PHYSIOLOGY. By W. D. HALLIBURTON. M.D., LL.D., F.R.S. Ninth Edition. London: Longmans, Green & Co. 1916. Pp. 324. 6s.

When a call is made for the ninth edition of a students' handbook it is clear that there can be little room for the reviewer. Professor Halliburton's book has helped many students to grasp the main facts of a complicated subject, and there can be little question that the present edition will not be found less useful than were its predecessors.

MANUEL D'ELECTROTHERAPIE ET D'ELECTRODIAGNOSTIC. Par M. le Dr. E. ALBERT WEIL. Préface par M. le Prof. A. GILBERT. 3me Edition. Paris: F. Alcan. 1916. Pp. 384. 108 Figures. 4 fr.

Parts dealing with X-rays in previous editions have been omitted. The method of localisation of metallic foreign bodies lodged in the tissues is interesting. A telephone is attached to the head of the operator, whose finger is enclosed in a sterilised finger-stall, in the tip of which is a small coil of fine wire. When the finger comes near the metallic foreign body the telephone informs the operator of the fact. The apparatus is known as La Braune-Pluvine's "audiscope finger-stall."

LABORATORY MANUAL IN GENERAL MICROBIOLOGY. London: Chapman & Hall. 1916. Pp. 418. 10s. 6d.

This manual has been prepared by the Laboratory of Bacteriology, Hygiene, and Pathology of the Michigan Agricultural College for the use of

students of agriculture and sanitary science. It follows the plan of definite laboratory exercises—simple and clearly designed—and may be found useful in classes other than those for which it was primarily intended.

ESSENTIALS OF MEDICAL ELECTRICITY. By E. R. MORTON, M.D., F.R.C.S.E.
Third Edition, Revised and Rewritten, with Addition of New Matter,
by E. P. CUMBERBATCH, M.A., M.B., Ch.B. Kimpton's Essential Series.
London : H. Kimpton. 1916. Pp. 317. 72 Figures. 6s. nett.

Probably the idea that electricity contains something mysterious and unfathomable by all but the specially trained has deterred the veterinary surgeon from taking up the electrical treatment of disease. This is to be regretted, for those of experience are persuaded that in electricity the general practitioner, scarcely less than the specialist, has a valuable instrument, the powers of which are as yet only in process of discovery. Enthusiasts hold that electrical treatment bears fair promise of supplanting the cruder methods of the past and the present.

Whoever would make himself acquainted with the essentials of the newer methods and action of electricity in treatment might do much worse than study the above book, which, in its third edition, has been thoroughly revised and brought up to date. Separate chapters are devoted to the consideration of ionisation, galvanisation, faradisation, and similar subjects. The practical acquaintance with the various methods is very evident from the manner in which they are handled.

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KING, M. R. "The Sino-Ventricular System as Demonstrated by the Injection Method." *Amer. Journ. Anat.* Vol. XIX., No. 2. 15th March 1916. Pp. 149-177. 5 Plates, 16 Figures.

A demonstration of the sino-ventricular system of muscle in the heart of calves, sheep, pig, dog, and cat. Lhamon's injection method was employed.

KOCH, S. L. "The Structure of the Third, Fourth, Fifth, Sixth, Ninth, Eleventh, and Twelfth Cranial Nerves." *Journ. Comp. Neur.* Vol. XXVI., No. 5. October 1916. Pp. 541-552. 5 Figures.

LOCY, W. A., and LARSELL, O. "The Embryology of the Bird's Lung, Based on Observations of the Domestic Fowl." *Amer. Journ. Anat.* Vol. XIX., No. 3. May 1916. Pp. 447-504. 68 Figures. *Ibid.* Vol. XX., No. 1. July 1916. Pp. 1-44. 22 Figures.

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SCHOCHET, S. S. "A Suggestion as to the Process of Ovulation and Ovarian Cyst Formation." *Anat. Record.* Vol. X., No. 6. 20th April 1916. Pp. 447-457.

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Amer. Journ. Anat. Vol. XX., No. 1. July 1916. Pp. 45-72. 16 Figures.

SUNDWALL, J. "The Lachrymal Gland." *Amer. Journ. Anat.* Vol. XX., No. 2. September 1916. Pp. 147-235. 20 Figures.

CLINICAL.

ARMSTRONG, W. E. "Hæmorrhage from the Spleen." *Vet. News.* Vol. XIII., No. 670. 4th November 1916. P. 465.

Two cases are described, in neither of which was there any history of accident or over-exertion. Both animals had been imported from U.S.A.

BARRON, R. "Specific Ulceration of the Genital Organs in Sheep." *Vet. Record.* Vol. XXIX., No. 1482. 2nd December 1916. P. 228.

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— "Open Stifle-Joint in a Mare." *Vet. News.* Vol. XIII., No. 667. 14th October 1916. P. 431.

— "A Case of Intussusception in a Horse." *Vet. News.* Vol. XIII., No. 667. 14th October 1916. P. 432.

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CARRE and VALLEE. "The Etiology of Infectious Anæmia of the Horse" (Sur l'étiologie de l'anémie infectieuse du cheval). *Rec. Méd. Vét.* Vol. XCII., No. 7. 15th April 1916. Pp. 193-199.

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CAZALBOU ET PRADEL. "Epizootic Lymphangitis in the Horse" (Au sujet de la lymphangite épidémique chez le cheval). *Rev. Path. Comp.* No. 124. June 1916. Pp. 14-16.

"Effects of Concussion in the Dog." *Vet. Record.* Vol. XXIX., No. 1481. 25th November 1916. Pp. 215-216.

Three cases of concussion, all the result of motor accidents, are recorded.

ELLIS, H. A. "The Diagnosis of Tuberculosis by Tuberculin." *Lancet.* Vol. CXCI., No. 4858. 7th October 1916. P. 638.

FAYET ET BONNEL, F. "Epizootic Lymphangitis in the War Zone" (Note sur un cas de lymphangite épidémique observé dans la zone des armées). *Rev. Path. Comp.* No. 124. June 1916. Pp. 17-19.

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HESLOP, G. G. "A New Form of Lymphangitis in Army Horses." *Vet. Journ.* Vol. LXXII., No. 496. October 1916. Australian Supplement. Pp. 29-32.

JONES, J. "Invagination of Small Intestine in a Bullock." *Vet. News.* Vol. XIII., No. 674. 2nd December 1916. P. 501.

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LANGFORD, E., and SCOTT, W. M. "Empyema of the Nasal Sinuses in a Thoroughbred Stallion." *Vet. News.* Vol. XIII., No. 666. 7th October 1916. P. 421.

LARROQUE. "Fatal Complicated Pericarditis in a Heifer" (Un cas curieux de péricardite compliquée mortelle, chez une génisse). *Rec. Méd. Vét.* Vol. XCII., No. 19. 15th October 1916. Pp. 552-555.

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— "Open Joint in the Horse." *Vet. Journ.* Vol. LXXII., No. 496. October 1916. P. 340.

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— "Prolapsus of Rectum in Sow: Amputation." *Vet. Record.* Vol. XXIX., No. 1482. 2nd December 1916. Pp. 228-229.

PATRICK, W. C. "Fracture of the Mandible of the Inferior Maxilla." *Vet. News.* Vol. XIII., No. 672. 18th November 1916. P. 481.

PEZET, CL. "Intestinal Strangulation with Independent Inguinal Hernia in a Mare" (Étranglement intestinal et hernie inguinale indépendants chez une jument). *Rec. Méd. Vét.* Vol. XCII., Nos. 15-16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 460-463. 1 Figure.

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FAYET. "Lameness Produced by the Mallein Test" (De la boiterie comme signe diagnostique de la malléination sous-cutanée). *Rec. Méd. Vét.* Vol. XCII., No. 20. *Bull. Soc. Centr. Méd. Vét.* 30th October 1916. Pp. 297-299.

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FAYET and BONNEL. "Epizootic Lymphangitis" (A propos de la lymphangite épidémique). *Rev. Path. Comp.* No. 127. October 1916. Pp. 18-19.

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SALISBURY, W. H. "Contagious Pleuro-Pneumonia of Horses." *Cornell Veterinarian.* Vol. VI., No. 3. July 1916. Pp. 142-147.

A short clinical history is given of nine cases, with suggested treatment.

UDALL, D. H. "Contagious Pleuro-Pneumonia of Horses." *Cornell Veterinarian.* Vol. VI., No. 3. July 1916. Pp. 148-157. 4 Plates, 6 Figures.

A general consideration of the disease, with an account of the researches of Gaffky and Lühr. "Symptomatic treatment should be directed towards the exhaustion and depression of heart weakness and toxæmia. Strychnin, arsenic, and oil of camphor are all useful. Ammonia and spirituous preparations may be administered in capsules. When the appetite is poor, warm milk with whisky may be given per rectum. More recently the soluble preparations of arsenic, like salvarsan and neosalvarsan, have proven of great

value in the treatment of military horses in Europe. . . . Atoxyl and sodium cacodylate have also been used, and a few favourable reports published, but their value is yet to be proven." In America no serious attempts have been made to restrict contagion by segregation, quarantine, and disinfection.

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WILLIAMS, W. L. "The Death and Expulsion of the Immature Fœtus as a Standard for Measuring the Prevalence of Cattle Abortion." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 1. October 1916. Pp. 29-40.

"The death and expulsion of the immature fœtus, which two occurrences combined we term 'abortion,' do not constitute a disease, a lesion, or, except with some important reservation, a symptom. Neither the death of the fœtus nor its expulsion from the uterus is basically of great significance."

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FERRY, N. S. "The Ophthalmic Test for Glanders, with a Simplified Method of Procedure." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 1. October 1916. Pp. 41-46.

The writer takes the usual method of preparing desiccated mallein as his starting-point. He moulds the purified mallein into small tablets with milk sugar in such a proportion that each tablet contains the exact amount of mallein required for the test. The tablet is placed directly on the conjunctiva at the inner canthus of the eye. It dissolves in one to three minutes without producing any discomfort or irritation.

GLOVER, A. D. "Hog Cholera and Diagnosis and Differential Diagnosis of Hog Cholera." *Amer. Journ. Vet. Med.* Vol. XI., No. 9. September 1916. Pp. 707.

ZELL, C. A. "The Value of Urine Examination in Dog and Cat Practice." *Amer. Journ. Vet. Med.* Vol. XI., No. 11. November 1916. Pp. 865-870. 2 Figures.

DIETETICS.

BERRY, R. A. "The Feeding of Dairy Cows on Pasture." *Bull. No. 76. West of Scot. Agric. Coll.* 1916. Pp. 15-48. 13 Tables.

"Broom-Rape" (*Orobanche minor* Sutt.). *Journ. Board of Agric. and Fish.* Vol. XXIII., Nos. 5 and 6. August and September 1916. Pp. 478 and 598.

In the August number of the above Journal attention was drawn to the prevalence of the parasitic weed broom-rape in clover fields during the summer. Broom-rape is parasitic on clover and on other plants and is capable of doing considerable damage; its seeds ripening before clover is cut facilitates the spread of the plant; furthermore, the seeds may lie dormant for many years in the soil. There has been some doubt as to the possibility of broom-rape being noxious to cattle should they eat it. In the September number of the same Journal, however, there is an instance recorded by Mr. R. G. Stapleton, M.A., of a field which was badly infested by broom-rape and which was cleared of it by cattle, the animals suffering no ill-effects and appearing to relish the weed.

BRUCE, W. "Cattle-Rearing." *Trans. High. and Agric. Soc.* Vol. XXVIII. 1916. Pp. 164-180.

"Calf-Feeding Experiments: Maize Meal Compared with a Calf Meal." *Journ. Agric. and Tech. Instr., Ireland.* Vol. XIV., No. 3. April 1916. Pp. 421-424.

"Cattle-Feeding Experiments." *Journ. Agric. and Tech. Instr., Ireland.* Vol. XVI., No. 3. April 1916. Pp. 424-429.

CROWTHER, C. "Palm-Kernel Cake." *Journ. Board of Agric.* Vol. XXIII., No. 8. November 1916. Pp. 734-749.

DUNLOP, J., and BAILEY, P. W. "Experiments in the Feeding of Dairy Cows." *Mid. Agric. and Dairy Coll.* 1916. Pp. 1-16.

"Live-Stock Feeding Experiments." *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVI., No. 3. April 1916. Pp. 418-430.

MACDOUGALL, R. S. "Some Common Grasses and How to Know Them." *Trans. High. and Agric. Soc.* Vol. XXVIII. 1916. Pp. 56-91. 52 Figures.

The purpose of this paper is to describe the best grasses, so that they can be recognised and identified. Along with the best grasses some others are described for special or comparative reasons.

PATERSON, W. G. R., and ROBB, L. "Calf-Feeding Experiments." *Bull. No. 68.* West of Scot. Agric. Coll. 1916. Pp. 45-60.

— "Pig-Feeding Experiments." *Bull. No. 75.* West of Scot. Agric. Coll. 1916. Pp. 1-12.

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SIMMONS, R. C. "Beef-Feeding Experiment." *Rhodesia Agric. Journ.* Vol. XIII., No. 5. October 1916. Pp. 620-625.

WEILL, E., MOURQUAND, G., and MICHEL, P. "Research on Nutritional Deficiency: Comparative Effects on Cats of an Exclusive Diet of Raw, Frozen, Salt, Cooked, and Sterilised Meat" (Recherches sur la carence alimentaire. Effets comparés de la nourriture exclusive des chats par la viande crue, congelée, salée, cuite et stérilisée). *C. R. Soc. Biol.* Vol. LXXIX., No. 5. 4th March 1916. Pp. 189-193.

WOOD, T. B. "Economy in Meat Production." *Land and Water.* 12th October 1916. Pp. 14-15. 4 Graphs.

WYLLIE, J. "Experiment on the Feeding of Pigs." *Bull. No. 77.* West of Scot. Agric. Coll. 1916. Pp. 81-98.

EVOLUTION.

BROOM, R. "Evolution and Mendelism." *Science Progress.* Vol. XI., No. 42. October 1916. Pp. 220-227.

GENERAL.

ELLIS, R. W. "Modern Requirements in the Shoeing of Horses, Especially in Cities." *Journ. Amer. Vet. Med. Assoc.* Vol. XLIX., No. 6. September 1916. Pp. 790-796.

Now that roads and streets are prepared for motor traffic, the writer contends that the only thing to do is to imitate the shoeing of the motor by using an all-rubber contact horse-shoe with as broad a surface as possible, in order to protect the horse from strains or more fatal injuries.

M'CRUDDEN, F. H. "Insufficient Oxygen Supply as a Factor in Disease." *Bost. Med. and Surg. Journ.* Vol. CLXXV., No. 14. 5th October 1916. Pp. 480-483.

An extensive bibliography is given.

STEWART, W. A. "The Economic Importance of Aberdeen Angus Cattle." *Journ. Board of Agric.* Vol. XXIII., No. 8. November 1916. Pp. 756-760.

A plea for the wider recognition of the value of this breed of cattle. The thriftiness of the breed, its value for milk-production, crossing and fattening are touched upon. It is pointed out that further particulars regarding Aberdeen Angus cattle are given in the Board's *British Breeds of Live-Stock*. 1s. net, post free.

GENETICS AND HEREDITY.

JENKS, A. E. "Spotted Asses." *Journ. Heredity.* Vol. VII., No. 4. April 1916. Pp. 165-168. 2 Figures.

"The Pure-Bred Ram." *Field.* Vol. CXXVIII., No. 3335. 25th November 1916. P. 802.

The importance and value of the pure-bred ram is dilated upon. "Fortunately, the growing appreciation of advantageous heredity ensures a good market for well-bred sires, and this circumstance in its turn is a guarantee that the supply of high-class rams will be maintained."

HISTORICAL.

FRANK, M. "The History of the Discovery of the Secretory Glands and their Function." *Bull. Johns Hopkins Hosp.* Vol. XXVI., No. 308. October 1916. Pp. 303-309. 4 Figures.

KENDALL, W. T. "Notes on the Early History of the Veterinary Profession in Victoria." *Vet. Journ.* Vol. LXXII., No. 496. October 1916. Australian Supplement. Pp. 37-45.

HYGIENE AND PREVENTIVE MEDICINE.

CURLEWIS, A. W. "Sheep Dips." *Journ. Dept. Agric., Victoria.* Vol. XIV., No. 7. July 1916. Pp. 423-432. 8 Figures.

Details of dipping-tanks, suitable for large and small flocks of sheep, are given.

MOUSSU, G. "Frozen Meat for the Civil Population" (La viande congelée pour la population civile). *Rec. Méd. Vét.* Vol. XCII., Nos. 15-16. 15th August to 15th September 1916. Pp. 470-478.

NEECH, J. T. "The Insanitary Gully." *Journ. Roy. San. Inst.* Vol. XXXVII., No. 3. September 1916. Pp. 141-143.

The author condemns as insanitary the street and yard gully which retains semi-liquid filth, and suggests the substitution of 6-inch self-cleansing traps, which would cost one-third the existing gully. Against the pecuniary gain would have to be set the expense of dealing with an increased amount of sludge, but at the same time the cost of cleansing the gullies would cease.

NOBBS, E. A., and SINCLAIR, J. M. "Compulsory Dipping." *Rhodesia Agric. Journ.* Vol. XIII., No. 4. August 1916. Pp. 466-473.

Gives an account of details and methods of procedure in regard to the application of the Compulsory Dipping Ordinance of 1914 which is now in operation in about 600 out of the 2000 occupied farms in the country.

MEDICINE.

KINGSLEY, A. T. "Bovine Haemorrhagic Septicaemia." *Amer. Journ. Vet. Med.* Vol. XI., No. 9. September 1916. Pp. 694-698.

METTAM, A. E., and CRAIG, J. T. "Diabetes Mellitus." *Journ. Comp. Path. and Therap.* Vol. XXIX., No. 1. March 1916. Pp. 1-25. 9 Figures.

ROGER. "Nervous Colics" (Quelques observations de coliques nerveuses). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1916. *Bull. Soc. Centr. Méd. Vét.* Pp. 209-215.

METHODS.

BENIANS, T. H. C. "Relief Staining for Bacteria and Spirochætes." *Brit. Med. Journ.* No. 2917. 25th November 1916. P. 722.

By the method here suggested a uniform blue field is obtained from which the unstained organisms stand out in sharp relief. "A small drop of a 2 per cent. aqueous solution of Congo red is placed on a slide, and a very small quantity of the bacterial culture, or of the exudate to be examined, is rubbed into it with platinum wire; the drop is then spread out into a tolerably thick film either with the wire or by means of another glass slide. The film, an opaque blood red, is allowed to dry; the slide is then washed over with a 1 per cent. solution of HCl in absolute alcohol and dried."

CARPANO, M. "A Rapid Method of Staining Negri Bodies of Rabies and the Special Structure brought out thereby" (Su di un metodo rapido de colorazione dei corpi di negri nella rabbia e sulla speciale struttura che si mette in evidenza col metodo stesso). *La Clinica Vet.* Vol. XXXIX., Nos. 11-12. 15th to 30th June 1916. Pp. 347-359. 2 Plates.

CAZALBOU, L. "The Natural Cultivation of Pathogenic Fungi" (La culture naturelle des champignons pathogènes). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 297. 15th September 1916. Pp. 410-421. 11 Figures.

DUJARRIC DE LA RIVIERE, R. "A New Culture Medium: 'Orange Jelly'" (Sur un nouveau milieu de culture: La "gélose à l'orange"). *C. R. Soc. Biol.* Vol. LXXIX., No. 16. 21st October 1916. Pp. 843-844.

The mixture consists of—

Orange juice	125 c.c.
Peptone bouillon (Martin)	75 c.c.

made into a jelly as one would produce bouillon jelly. The orange juice may be replaced with that of different fruits, particularly apple.

GARROW, R. P. "The Angle of the Dropping Pipette and Accuracy in Agglutination Technique." *Lancet.* Vol. CXCI., No. 4864. 18th November 1916. P. 863. 1 Figure.

The number of drops, and therefore the size of each drop, which a dropping pipette will deliver from a given quantity of liquid varies considerably with the angle at which the pipette is held. The only correct position in which to hold the dropping pipette is the vertical position.

JUDAH, E. L. "Mounting Specimens under Petri Dishes and Clock Glasses." *Anat. Record.* Vol. XI., No. 2. September 1916. Pp. 53-55.

RAINY, H., and HAWICK, Miss C. M. "Clinical Methods of Estimation of Sugar in the Blood." *Proc. Roy. Soc. Edin.* Vol. XXXVI., Pts. 1 and 2. 1915-16. Pp. 186-191.

OBSTETRICS.

BOUWMAN, J. "Remarks with Reference to Prolapse of the Vagina and Rigid Cervix in the Cow." *Vet. News.* Vol. XIII., No. 672. 18th November 1916. Pp. 481-482.

PARKER, J. H. "Triplets in Calves." *Vet. Record.* Vol. XXIX., No. 1475. 14th October 1916. P. 157.

WYNN-LLOYD, J. W. "Inversion of the Vagina in Cows." *Vet. News.* Vol. XIII., No. 668. 21st October 1916. P. 442.

Three cases are described.

PARASITOLOGY

(Including Entomology and Protozoology).

BEKENSKY, P. "Spirochætes in the Alimentary Tract of Pigs and their Relation to Swine Fever" (Contribution à l'étude des spirochètes des voies digestives des porcs dans leurs rapports avec la peste porcine). *Rec. Méd. Vét.* Vol. XCII., No. 19. 15th October 1916. Pp. 545-552.

BOUIN. "Trypanosomiasis of the Dromedary in Western Morocco" (Trypanosome des dromadaires au Maroc occidental). *Rec. Méd. Vét.* Vol. XCII., Nos. 15-16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 463-466.

The disease has been seen only in the region of Marrake. The natives, who consider it fatal, know it by the name of "El Debab." Morphologically the organism resembles the trypanosome of the Soudan, and has only been found in the blood of sick dromedaries.

BOULENGER, C. L. "Sclerostome Parasites of the Horse in England." I. The Genera *Triodontophorus* and *Esophagodontus*. *Parasitology.* Vol. VIII., No. 4. June 1916. Pp. 420-439. 1 Plate, 7 Text Figures.

Describes two new species of *Triodontophorus*.

BULL, L. B. "A Granulomatous Affection of the Horse—Habronemic Granulomata (Cutaneous Habronemiasis of Railliet)." *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 3. September 1916. Pp. 187-199. 5 Figures.

CHUN, J. W. H. "Horse Flies and Anthrax." *China Med. Journ., Shanghai.* Vol. XXX., Pt. 2. March 1916. P. 89.

It seems that anthrax in horses is not uncommon in Harbin, and it is suggested that the disease may be transmitted to the human subject by Tabanids.

CRAWLEY, H. "The Zoological Position of the Sarcosporidia." *Proc. Acad. Nat. Sci., Philadelphia.* June 1916. Pp. 379-388.

DUKE, H. L. "Trypanosomiasis in Northern Uganda." *Journ. Hygiene.* Vol. XV., No. 3. September 1916. Pp. 372-387. With Map.

FANTHAM, H. B., and PORTER, A. "The Significance of Certain Natural Flagellates of Insects in the Evolution of Disease in Vertebrates." *Journ. Parasit.* Vol. II., No. 4. June 1916. Pp. 149-166.

— "The Pathogenicity of *Giardia (Lamblia) intestinalis* to Men and to Experimental Animals." *Brit. Med. Journ.* 29th July 1916. Pp. 139-141.

In both human and animal lambliasis, erosion and distortion of the intestinal epithelial cells occurred owing to the direct suctorial action of the flagellate. Kittens and mice were used in the experiments. Infected kittens died in from six to fifty-three days, the chief symptoms being diarrhoea and emaciation.

FINZI, G. "Leishmaniasis and Tuberculosis in the Dog" (Leishmaniose et tuberculose chez le chien). *Bull. Soc. Path. Exot.* Vol. IX., No. 7. July 1916. Pp. 429-432.

An account of Leishmaniasis and generalised tuberculosis in a dog naturally infected in Africa.

FRANCO, E. E., and BORGES, J. "Bovine Sarcosporidiosis" (Sur la sarcosporidiose bovine). *Arg. Inst. Bact. Camara Pestana.* Vol. IV., No. 3. 1916. Pp. 269-289. 11 Plates, 10 Coloured.

HALL, M. C. "A New and Economically Important Tapeworm—*Multiceps Gaigeri*—from the Dog." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 2. November 1916. Pp. 214-223. 4 Figures.

KING, W. E., and DRAKE, R. H. "The Antigenic Value of *Spirocheta Hyos* in Complement-Fixation Tests on Hog-Cholera Sera. Studies on Hog Cholera." *Journ. Infect. Dis.* Vol. XIX., No. 1. July 1916. Pp. 46-62.

— "Further Studies of Hog Cholera with Reference to *Spirocheta Hyos*." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 2. November 1916. Pp. 168-188. 6 Figures, 3 Tables.

KNESE. "Sarcoptic Mange of Horses and its Treatment" (Die Sarcoptes-räude der Pferde und ihre Behandlung). *Deutsche tierärztl. Wochenschr.* Vol. XXIV., No. 21. 20th May 1916. P. 195.

LA FONSECA, O. O. R. "Studies on the Flagellate Parasites of Mammals in Brazil" (Estudos sobre os flagelados parasitos dos mamiferos do Brazil). *Mem. Inst. Oswaldo Cruz.* Vol. VIII., No. 1. 1916. Pp. 5-40. 2 Plates, 4 Figures.

On the flagellates of the intestine of mammals. Records two species of *Sphaeromonas* from rumen of ox, and a species of *Callimastix* from rumen of ox and sheep.

LIGNOS, A. "Canine Leishmaniasis at Hydra" (La Leishmaniose canine à Hydra). *Bull. Soc. Path. Exot.* Vol. IX., No. 5. May 1916. P. 302.

LLOYD, L. "Report on the Investigation into the Bionomics of *Glossina morsitans* in Northern Rhodesia, 1915." *Bull. Entom. Research.* Vol. VII., No. 1. May 1916. P. 67. 1 Plate, 2 Figures.

MAYR, L. "The Destruction of Lice on Horses with Ikaphthisol" (Die Bekämpfung der Pferdelaus mit Ikaphthisol). *Berliner tierärztl. Wochenschr.* Vol. XXXII., No. 24. June 1916. Pp. 279-281.

Ikaphthisol—a white powder consisting of magnesium carbonate, bolus alba, talc, crude cresol, sapo medicatus, and oxytoluol or cresyl alcohol—is recommended as the best means of killing lice on horses. Five to seven ozs. of the powder are dusted on the horse, and the lice, which are killed in a few minutes, are combed out. A second application may be necessary in bad cases.

MEGGITT, F. J. "A Tri-Radiate Tapeworm" (*Anoplocephala perfoliata* Goeze) from the Horse." *Parasitology.* Vol. VIII., No. 4. June 1916. Pp. 379-389. 1 Plate, 2 Text Figures.

— "A Contribution to the Knowledge of the Tapeworms of Fowls and of Sparrows." *Ibid.* Pp. 390-410.

From fowls—*Davainea dubius* n.sp., *D. cesticillus*, and *Amabolenia sphenooides*.

RILEY, W. A., and CHANDLER, W. L. "The Occurrence of the Giant Nematode on the Liver of a Dog." *Cornell Veterinarian.* Vol. VI., No. 4. October 1916. Pp. 209-212. 2 Plates, 5 Figures.

RILEY, W. A. "The Occurrence of the Giant Nematode, *Dioctothyme renale* (*Eustrongylus*), in the United States and Canada." *Journ. Amer. Vet. Med. Assoc.* Vol. XLIX., No. 6. September 1916. Pp. 801-809.

There are herein reported twenty-seven definite cases of the occurrence of the giant nematode (*Dioctothyme renale*) in the United States and Canada. Of these nineteen are published for the first time, while eight were already on record. Twelve of the twenty-seven, or 44 per cent., relate to the occurrence of the worms in the peritoneal cavity. The four cases of supposed occurrence of the parasite in man in the United States cannot be accepted. Available data afford no safe basis for determining the percentage of infestation of the dog.

SCHUMANN, P. "Notes on Sarcoptic Mange of the Horse" (Beitrag zur Sarkoptesräude des Pferdes). *Deutsche tierärztl. Wochenschr.* Vol. XXIV., No. 21. 20th May 1916. P. 194.

The author conducted experiments with two horses, and arrived at the following conclusions:—(1) The incubation period lasted seventeen days in a horse with a long winter coat, and twenty-four days where the hair was shorter. (2) Long winter hair affords more favourable conditions for the parasites.

SHIPLEY, P. G. "The Vital Staining of Mitochondria in *Trypanosoma Lewisii* with Janus Green." *Anat. Record.* Vol. X., No. 6. 20th April 1916. Pp. 439-445. 8 Figures.

STEWART, F. H. "On the Life-History of *Ascaris Lumbricoides*." *Brit. Med. Journ.* 1st July 1916. Pp. 5-7.

VELU. "Equine Spirillosis in Morocco" (Sur la spirillose équine au Maroc). *Rec. Méd. Vét.* Vol. XCII. 15th April 1916. Pp. 215-224. 2 Figures.

Three cases of spirillosis have been observed in horses at Casablanca. The symptoms resemble those of trypanosomiasis. The prognosis is good. The disease can be transmitted to the dog, the rabbit, and the rat.

— "Note on a Lesion of Intestinal Myiasis in the Horse" (Note sur une lésion de myase intestinale chez le cheval). *Rec. Méd. Vét.* Vol. XCII., No. 13. 15th July 1916. Pp. 408-410. 2 Figures.

— "An Interesting Case of Cœnurus Cerebralis in a Gazelle" (Un cas intéressant de cénurose chez la gazelle). *Rec. Méd. Vét.* Vol. XCII., No. 19. 15th October 1916. Pp. 555-556.

An enormous cœnurus involved the whole of the right and the anterior part of the left cerebral hemisphere. The cyst had produced absorption of the bone and caused a bulging of the skin. An operation was performed, but the patient died of cerebral hæmorrhage.

BIBLIOGRAPHY—PATHOLOGY AND BACTERIOLOGY 87

WARE, F. "The Possibility of Amœbic Dysentery in the Dog, and its Treatment with Emetin." *Journ. Comp. Path. and Therap.* Vol. XXIX., No. 2. June 1916. Pp. 126-130.

WATERSTON, J. "Fleas as a Menace to Man and Domestic Animals: their Life-History, Habits, and Control." *Brit. Mus. (Nat. Hist.) Economic Series*, No. 3. 1916. Pp. 21. 6 Figures.

The British species mentioned are—*Pulex irritans*, *Ctenocephalus canis*, *Ctenocephalus felis*, *Ceratophyllus fasciatus*, *Ceratophyllus gallinae*, *Spilopsyllus cuniculi*, and *Leptopsylla musculi*.

WICKWARE, A. B. "Is *Leucocytozoon anatis* the Cause of a New Disease in Ducks?" *Rep. Vet. Director-General Dept. Agric., Canada.* 1916. Pp. 95-97.

Further experimental evidence is necessary before general conclusions can be drawn. The author is not prepared to say that *Leucocytozoon* is the causal agent of the disease; but the fact was established that the parasite is present in large numbers in affected birds and absent in all controls. Another feature of moment is the disappearance of the mature forms of the parasite from the blood-stream of the affected ducks apparently coinciding with the period of recovery from disease.

YAKIMOFF, W. I., SCHOKHOR, N. J., and KOSELKINE, P. M. "Spirochætosis of Fowls in Russian Turkestan" (Spirochétose des poules au Turkestan russe). *Bull. Soc. Path. Exot., Paris.* Vol. IX., No. 4. 12th April 1916. P. 227.

PATHOLOGY AND BACTERIOLOGY.

CAZALBOU, L. (1) "General Remarks on the Ringworms and the Cultivation of their Causal Organisms" (Considérations générales sur les teignes et les cultures de leurs agents parasitaires). *Rev. Gén. Méd. Vét.* Vol. XXIV., No. 278. July 1914.

(2) "The Natural Cultivation of Pathogenic Micro-Organisms" (La culture naturelle des champignons pathogènes). *Ibid.* Vol. XXV., No. 297. September 1916.

These two papers should be read together, the first dealing with the general mycological characters of the dermatophytes in culture media and the natural development of *Achorion sericei*, together with some reflections on the possible relationship between the dermatomycoses and other mycoses, and between the pathogenic moulds and the bacteria, etc.; the second, with what is termed the natural cultivation of pathogenic moulds, the technique of which is described in the first paper.

88 BIBLIOGRAPHY—PATHOLOGY AND BACTERIOLOGY

COSTA, S., and TROISIER, J. "Jaundice Produced Experimentally in the Dog by Inoculation with *B. icterigenes*" (Ictère expérimental du chien, par inoculation de *B. icterigenes*). *C. R. Soc. Biol.* Vol. LXXIX., No. 5. 4th March 1916. Pp. 178-180.

The authors found that the dog does not react readily to inoculation with *B. icterigenes*. Animals were often resistive to quite large doses. It is difficult to determine whether the immunity is natural or acquired, individual or hereditary. It appears as though the *chien des rues* is, in general, more resisting than the *chien de race*. When, however, the animal is not refractory, very clear reactions are produced.

GRIFFITH, F. "On the Pathology of Bovine Actinomycosis." *Journ. Hygiene.* Vol. XV., No. 2. January 1916. Pp. 195-207.

LEESE, A. S. "Papilloma in the Bladder of a Mare." *Vet. Journ.* Vol. LXXII., No. 494. August 1916. Pp. 271-272. 1 Figure.

M'FADYEAN, J., SHEATHER, A. I., and EDWARDS, J. T. "John's Disease." *Journ. Comp. Path. and Therap.* Vol. XXIX., Pts. 2 and 3. June and September 1916. Pp. 134-171 and 201-243. 13 Figures, 12 Charts.

MAHON, F. C. "Mollities Ossium in a Shetland Pony: Résumé of Diseases of Bone Nutrition." *Vet. Journ.* Vol. LXXII., No. 494. August 1916. Pp. 253-258.

This paper mainly consists of a survey of diseases of bone. A short account is given of the post-mortem examination of one case.

PETIT, G., and GERMAIN, R. "Benign Mammary Tumours of the Dog and Cat" (Les tumeurs bénignes de la mammelle chez la chienne et la chatte). *Rec. Méd. Vét.* Vol. XCII., Nos. 17-18. *Bull. Soc. Centr. Méd. Vét.* 30th August to 30th September 1916. Pp. 239-260. 13 Figures.

An account is given of the macroscopic and microscopic characters of fibro-adenomata, osteo-chondromata, and osteo-chondro-adenomata, as they occur in the mammary gland of the dog and cat.

SEDDON, H. R. "A Case of Melano-Sarcoma in the Dog." *Vet. Journ.* Vol. LXXII., No. 496. October 1916. Australian Supplement. P. 46.

Report of a post-mortem examination. Melano-sarcoma with metastases in the lungs, spleen, etc., are commonly associated in Victoria with a primarily ulcerating skin growth, and often, in addition, with the presence of a varying number of pigmented cutaneous warts.

BIBLIOGRAPHY—PHARMACOLOGY AND THERAPEUTICS 89

STAINTON, F. H. "Bilateral Psammoma in the Horse." *Vet. Journ.* Vol. LXXII., No. 494. August 1916. Pp. 270-271. 1 Figure.

STOCKMAN, S. "Louping-Ill." *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 3. September 1916. Pp. 244-264.

PHARMACOLOGY AND THERAPEUTICS.

CHENIER. "The Use of Areca Nut for Tapeworms" (Emploi de la noix d'Arec contre le tænia). *Rev. Path. Comp.* No. 125. July 1916. Pp. 24-25.

The writer of this short note claims that several times he has seen the expulsion of parasites from the dog in less than ten minutes after administration of the drug. It is necessary, however, that the nut should be quite fresh and that the stomach should be completely empty.

DAKIN, H. D., COHEN, J. B., DAUFRESNE, M., and KENYON, J. "The Antiseptic Action of Substances of the Chloramin Group." *Proc. Roy. Soc., Lond.* Vol. LXXXIX., B., No. 614. 6th May 1916. Pp. 232-251.

EGGLESTON, C. "The Antagonism between Atropin and Certain Central Emetics." *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 11-25. 3 Tables, 1 Chart.

FRASER, T. R. "A Contribution to the Pharmacology of *Aconitum Heterophyllumoides*, *A. Nagarum* and *A. Napellus*." *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 43-56. 5 Tables, 1 Figure.

MACHT, D. I., JOHNSON, S. L., and BOLLINGER, H. J. "On the Peripheral Action of the Opium Alkaloids." *Journ. Pharmacol.* Vol. VIII., No. 8. August 1916. Pp. 451-463.

MAHON, F. C. "Notes on Indian Hemp, *Cannabis Indica*, and Henbane (*Hyoscyamus*) in Canine and other Practice." *Vet. Journ.* Vol. LXXII., No. 497. November 1916. Pp. 347-351.

"The chief uses to which hyoscine seems most applicable are in brain affections, and allied inflammatory conditions following the results of the poison of distemper or influenza in dogs and cats," in which cases the author strongly recommends its employment.

MALCOLM, W. S. "Vaccine in Mediastinal Actinomycosis." *Brit. Med. Journ.* No. 2910. 7th October 1916. P. 488.

Subcutaneous injections of actino-fragments led to a favourable result in a human patient.

MYERS, H. B. "Cross Tolerance. Altered Susceptibility to Codein, Heroin, Cannabis Indica, and Chloral Hydrate in Dogs having an Acquired Tolerance for Morphin." *Journ. Pharmacol.* Vol. VIII., No. 8. August 1916. Pp. 417-437.

PORET. "Intravenous Injections of Solutions of Phenol and Guaiacol in Strangles, Purpura, and Contagious Pneumonia" (Solutions phéniquées et gaiacolées en injections intraveineuses contre la gourme, l'anasarque, la pneumonie contagieuse). *Rec. Méd. Vét.* Vol. XCII., Nos. 17, 18. *Bull. Soc. Centr. Méd. Vét.* 30th August to 30th September 1916. Pp. 261-267.

ZUNZ, E., and TYSEBAERT, J. "On the Action of Atropin Sulphate on the Isolated Stomach and Bowel of the Dog." *Journ. Pharmacol.* Vol. VIII., No. 6. June 1916. Pp. 325-327. 8 Figures.

Atropin has a depressant action on both stomach and bowel. The production of the substance which excites movement and the reaction of the intestine to this substance did not seem to be influenced by the previous injection of atropin.

PHYSIOLOGY (Including Physiological Chemistry).

BAYLISS, W. M. "The Physiological Work of Ivan Petrovich Pavlov." *Brit. Med. Journ.* No. 2919. 9th December 1916. Pp. 799-800.

BERRY, R. A. "The Yield and Composition of Cows' Milk during Lactation." *Bull. No. 76.* West of Scot. Agric. Coll. 1916. Pp. 49-73. 6 Graphs, 12 Tables.

CANNON, W. B. "Conditions Affecting Secretion of the Thyroid Gland." *Bost. Med. and Surg. Journ.* Vol. CLXXV., No. 16. October 1916. Pp. 562-563.

The conclusion is drawn that the nerves distributed to the thyroid cells belong to the sympathetic and not to the vagus, and that their effects are not indirect through alterations of the blood flow; they are true secretory nerves.

Injections of small doses of adrenin, 0·1 to 0·2 c.c. (1:100,000), evoke a marked action on thyroid secretion.

It is possible that the thyroid, like the adrenal, has, normally, functions which are performed in times of critical emergency. It may be that such an emergency function is an exaggerated form of the routine activity of the gland.

CHASE, M. R. "An Experimental Study of the Vagus Nerve." *Journ. Comp. Neur.* Vol. XXVI., No. 4. 15th August 1916. Pp. 421-428. 4 Figures.

Experimental section of the vagus alone and of the combined vagus and sympathetic led to the conclusion that the unmyelinated character of the thoracic vagus nerve in the dog is not due to the presence of fibres derived from the sympathetic trunk during the close association of the vagus and sympathetic nerves in the neck.

GAUTIER, A., and CLAUSMANN, P. "Fluorin in the Vegetable Kingdom" (*Le fluor dans le règne végétal*). *C. R. Acad. Sci.* Vol. CLXII., No. 3. 17th January 1916. Pp. 105-112.

In order to find the source of fluorin in the animal body, the authors determined the percentage of fluorin and phosphorus in different plants which form the food of man and herbivores. There is no particular group of plants in which fluorin is abundant. The leaves are generally richest in fluorin and phosphorus; the stem, wood, and bark are poorest.

HALLIBURTON, W. D. "The Possible Functions of the Cerebro-Spinal Fluid": An Address delivered before the Neurological Section of the Roy. Soc. Med. *Brit. Med. Journ.* No. 2914. 4th November 1916. Pp. 609-612. *Lancet.* Vol. CXCI., No. 4862. 4th November 1916. Pp. 779-782.

The writer considers that the cerebro-spinal fluid should be regarded as the perfect physiological medium—more perfect, doubtless, than the artificial fluids made in the laboratory—but in its essential features closely resembling those associated with the names of Ringer and Locke.

HATCHER, R. A., and SMITH, M. I. "The Elimination of Strychnin by the Kidneys." *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 27-41. 2 Tables.

KENDALL, E. C. "Recent Advances in our Knowledge of the Active Constituent in the Thyroid: Its Chemical Nature and Function." *Bost. Med. and Surg. Journ.* Vol. CLXXV., No. 16. October 1916. Pp. 557-562. 16 Figures.

MARINE, D., and ROGOFF, J. M. "How Rapidly does the Intact Thyroid Gland Elaborate its Specific Iodin-containing Hormone." *Journ. Pharmacol.* Vol. IX., No. 1. October 1916. Pp. 1-10.

Following the injection of 50 milligrammes of potassium iodide into the circulation definite histological changes can be detected within twenty hours in favourable cases. The storage of iodin in the thyroid from salts of this element is practically instantaneous, while elaboration of the hormone is slow. After thirty hours only a small fraction of the iodin taken up in as many seconds is transformed into the specific hormone.

MARSHALL, E. K., and DAVIS, D. M. "The Influence of the Adrenals on the Kidneys." *Journ. Pharmacol.* Vol. VIII., No. 9. September 1916. Pp. 525-550.

MULLER, H. R., and WEED, L. H. "Notes on the Falling Reflex of Cats." *Amer. Journ. Physiol.* Vol. XL. May 1916. P. 373.

As is well known, if a normal cat be held back downwards a foot from the floor and allowed to drop, she will light on her feet. Some will make the turn in as little as 6 ins. The authors arrived at the opinion that the reflex depends on excitations derived either from the eyes or from the semi-circular canals. Loss of one only of these channels does not interfere with the reflex, but loss of both abolishes it. There seems to be some influence exerted by the cerebral cortex. The falling reflex is probably an acquired form of protective mechanism.

PITICARIU, J. "The Action of Secretin on the Kidney" (L'action de la sécrétine sur le rein). *C. R. Soc. Biol.* Vol. LXXIX., No. 16. 21st October 1916. Pp. 871-872.

The connection between the internal secretion of the intestine (secretin) and the renal secretion being little known, experiments on dogs were undertaken to endeavour to throw light on the connection. It seems that secretin excites the kidney to activity as it does the pancreas; but the secretin must have been obtained from the same species of animal as that experimented upon. For example, secretin prepared from the duodenal mucous membrane of the ox was not capable of producing an increased flow of urine in the dog, whereas secretin from the dog produced a flow which reached its maximum in from fifteen to twenty minutes. The product of renal activity under the influence of secretin has all the characters of normal urine.

ROGER, J. "Oxalæmia in Domestic Animals" (L'oxalémie des animaux domestiques). *Rec. Méd. Vét.* Vol. XCII., Nos. 17, 18. *Bull. Soc. Centr. Méd. Vét.* 30th August to 30th September 1916. Pp. 268-278.

SERES É IBARS. "Functional Vesico-Renal Correlation" (Corrélation fonctionnelle vésico-rénale. Voie anatomique que suit l'excitation vésicale). *C. R. Soc. Biol.* Vol. LXXIX., No. 16. 21st October 1916. Pp. 812-815.

Experimentation on many dogs has demonstrated a system of correlation between the function of the bladder and the kidney. Excitation of the bladder by distension and faradisation produced an increased flow of urine. Extirpation of the vesico-renal ganglion abolished the correlation. There seems to be the possibility of a new method of excitation of renal secretion which might be used in some case of anuria—particularly those of nervous origin—by successive distension and evacuation of the bladder.

SLOVTZOV, B. "The Biochemical Composition of Semen" (Sur la composition biochimique du liquide spermatique). *C. R. Soc. Biol.* Vol. LXXIX., No. 5. 4th March 1916. P. 208.

POULTRY DISEASES.

HIGGINS, C. H. "Enterो-hepatitis or Black-head in Turkeys." *Amer. Journ. Vet. Med.* Vol. XI., No. 10. October 1916. Pp. 793-795.

PICKENS, E. M. "Roup and Chicken-pox." *Cornell Veterinarian.* Vol. VI., No. 3. July 1916. Pp. 128-141. 3 Plates, 13 Figures.

SEROLOGY AND IMMUNOLOGY.

BEVAN, L. E. W. "Immunity in its Relation to the Stock Diseases of Southern Rhodesia." *Rhodesia Agric. Journ.* Vol. XIII., No. 5. October 1916. Pp. 640-651.

BIRCH, R. R. "Hog Cholera and Its Prevention." *Cornell Veterinarian.* Vol. VI. No. 2. May 1916. Pp. 90-111. 10 Plates.

This article was specially prepared to meet the needs of the practising veterinary surgeons in New York. A general survey of the disease is given, along with a full account of the methods of preparation and use of the anti-hog-cholera serum.

DEAN, H. R. "The Mechanism of Serum Reaction." The Horace Dobell Lecture, R.C.P.(Lond.). *Brit. Med. Journ.* No. 2918. 2nd December 1916. Pp. 749-752.

A general survey of the subject. Professor Dean anticipates that great difficulties will be encountered before any entirely satisfactory explanation of the reaction is arrived at. But these difficulties will be met, and with a more perfect knowledge of the mechanism of serum reactions will be attained a more perfect knowledge of the laws which govern both natural and acquired immunity.

FENESTRE, and GERARD, P. "The Absence of Tetanic Toxin in the Cerebro-spinal Fluid" (Sur l'absence de toxine tétanique dans le liquide céphalo-rachidien, chez les sujets atteints de tétonos). *C. R. Soc. Biol.* Vol. LXXIX., No. 16. 21st October 1916. Pp. 850-851.

Though their observations do not agree with the opinion expressed by Bard and given in the standard text-books, the authors are of opinion that they have demonstrated the absence of tetanic toxin in the cerebro-spinal fluid in three typical cases of tetanus.

94 BIBLIOGRAPHY—SEROLOGY AND IMMUNOLOGY

GRAHAM, R. "The Results of the Use of Hog-Cholera Globulin on Three Thousand Hogs in the Field." *Amer. Journ. Vet. Med.* Vol. XI., No. 9. September 1916. Pp. 703-708. 8 Tables.

HOMER, ANNIE. "An Improved Method of Concentration of Antitoxic Sera." *Journ. Hygiene.* Vol. XV., No. 3. September 1916. Pp. 388-400.

It is claimed that the method described is an improvement on the Gibson-Banzhaf method and the Banzhaf one-fraction method, and is a further step towards the desirable goal, namely, the preparation, on a commercial scale for general therapeutic use, of antitoxic sera with a minimum amount of attendant protein.

HOSKINS, H. P. "Observations on Two Thousand Eight Hundred Pigs Inoculated with Hog-Cholera Virus." *Journ. Amer. Vet. Med. Assoc.* Vol. XLIX., No. 6. September 1916. Pp. 817-829. 8 Tables, 1 Chart.

MERIEUX. "On the Action upon Tetanic Wounds of Desiccated Antitetanic Serum to which Subgallate of Bismuth has been added" (De l'action sur les plaies tétanique du sérum antitétanique desséché, additionné de sous-gallate de bismuth). *C. R. Soc. Biol.* Vol. LXXIX., No. 5. 4th March 1916. Pp. 199-201.

NORRIS, R. V. "A Comparison of the 'Defibrination' and 'Oxalate' Methods of Serum Preparation as applied to Hæmorrhagic Septicæmia and Anthrax Sera, together with some Analyses of Buffalo and Hill Bull Blood." *Bull. No. 60.* Agric. Research Inst., Pusa. 1916. Pp. 1-15. 20 Tables.

SCHOENLEBER, F. S. "Simultaneous Vaccination against Black-leg." *Amer. Journ. Vet. Med.* Vol. XI., No. 10. October 1916. Pp. 796-797.

The writer states that no black-leg vaccine on the market to-day is in every case reliable, and that no black-leg vaccine can be made which will at the same time not kill and still permanently protect the calf. It is claimed that the Kansas black-leg serum is free from all organisms and can safely be used on the finest bred animals. The serum will not only protect animals against black-leg, but when given in its early stages will often check the disease. The serum is the sterile filtered serum of animals highly immunised against black-leg by means of cultures of the black-leg organism (*bacillus Chauveaui*).

VELOPPE. "Treatment of 'Mal de Chien' by Neurosthenic Serum" (Traitement du "mal de chien" par le sérum névrosthénique). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 296. 15th August 1916. Pp. 360-365.

WATSON, E. A. "Dourine and the Complement-Fixation Test." *Rep. Vet. Director-General, Dept. Agric., Canada.* 1916. Pp. 101-119.

A full account is given of the principles and method of the test. "In conclusion, I venture to express absolute confidence in the complement-fixation test for dourine as it is now presented, and to claim that apparent failures or discrepancies are due, not to the method itself, but to faulty technique on the part of the operators or of the collectors of the test serum."

SKIN DISEASES.

ARMFIELD, J. M. "A Peculiar Skin Disease of Cattle in North-Western Rhodesia." *Vet. Journ.* Vol. LXXII., No. 495. September 1916. Pp. 308-310.

DODD, S. "Trefoil Dermatitis." *Journ. Comp. Path. and Therap.* Vol. XXIX., No. 1. March 1916. Pp. 47-62.

YATES, G. "Chronic Eczema." *Vet. Record.* Vol. XXIX., No. 1476. 21st October 1916. P. 166.

The case occurred in a dachshund. Two c.c. of a 1 per cent. solution of collargol were injected into the muscles of the thigh at intervals of a few days: altogether six injections were made. The result was satisfactory.

SURGERY.

BOND, P. G. "Paracentesis Abdominis." *Vet. Journ.* Vol. LXXII., No. 495. September 1916. Pp. 303-305.

The author concludes that the operation is not resorted to as often as it should be.

CHATELAIN, P. "Serum Osmosis. Treatment of Wounds by Blood-Serum Obtained by Osmosis" (Sérum-osmose. Traitement des plaies par le sérum sanguin obtenu par osmosis). *Rec. Méd. Vét.* Vol. XCII., No. 13. 15th July 1916. Pp. 393-397.

DAMAN, T. W. A. "The Use of Glycerin and Ichthyol in the Treatment of Septic Wounds" *Brit. Med. Journ.* No 2915. 11th November 1916. Pp. 646-647.

The dressings need to be applied, at most, only night and morning, and in many cases one dressing in twenty-four hours is ample. The glycerin produces rapid and free osmosis. Osmosis ensures a supply of blood-serum to

those tissues which need repair, and, what is better, a supply of autogenous serum full of antibodies. A mixture of glycerin and ichthyl in varying strengths has been used, and the results are satisfactory. The method is well worthy of employment in every case of open wound, accompanied by sepsis, induration, and pain.

DRIVER, H. C. "Pelvic Fracture." *Vet. Record.* Vol. XXIX., No. 1476. 21st October 1916. P. 166.

FREGER, M. "Some Extemporised Instruments used during the Campaign 1914-15" (*Quelques instruments "de Fortune" utilisés pendant la campagne 1914-15*). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 296. 15th August 1916. Pp. 354-360. 9 Figures.

An account of instruments, such as tracheotomy tubes, cannulas, etc., extemporised from material, sometimes very unpromising, when the regular veterinary equipment fails in the field.

GLENDINNING, C. G. "When and how to Perform Rumenotomy." *Amer. Journ. Vet. Med.* Vol. XI., No. 11. November 1916. Pp. 873-874.

LECLAINCHE, E., and VALLEE, H. "Specific Serum Treatment of Wounds, (Le traitement sérique spécifique des plaies). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 295. 15th July 1916. Pp. 306-316.

LHOSTE, A. "The Sugar Treatment of Wounds" (*Traitemenit des plaies par le sucre*). *Rev. Path. Comp.* No. 125. July 1916. Pp. 22-23.

MAYO, W. J. "Some of the Maladies in which Splenectomy may be Indicated." *Lancet.* Vol. CXCI., No. 4865. 25th November 1916. Pp. 889-892.

"Physiologically the spleen is of but moderate importance, and its removal does not cause serious changes in the human economy." "For convenience the diseases with which the spleen is concerned may be roughly classified into three groups—(1) Splenomegalias of parasitic origin; (2) splenomegalias of probably toxic origin associated with anaemia and cirrhosis of the liver; and (3) splenomegalias associated with blood dyscrasias."

MILKS, H. J., and MULDOON, W. E. "Some Common Diseases of the Ear of Small Animals." *Cornell Veterinarian.* Vol. VI., No. 4. October 1916. Pp. 197-204.

The etiology, symptoms, and treatment of serous cysts of the ear, ulceration of the concha, non-parasitic and parasitic inflammation of the external auditory canal are discussed.

O'CONNOR, J. "The Treatment of Wound Infection." *Brit. Med. Journ.* No. 2918. 2nd December 1916. Pp. 755-756.

The object of this communication is to ask surgeons to give the following method a trial alongside other cases treated by other methods:—Four-hourly irrigation with hot peroxide solution (2 ozs. to the litre), followed instantly by hot carbolic lotion ($\frac{1}{2}$ oz. to the litre), and the application of hot mercuric chloride fomentations (wrung dry).

PERRIER. "New Operation for Cartilaginous 'Quittor'" (Nouveau manuel opératoire du javart cartilagineuse). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 297. 15th September 1916. Pp. 402-410. 5 Figures.

POST. "Treatment of a Large Wound by Delbet's Solution" (Traitement d'une vaste plaie par la solution du Professeur Delbet). *Rev. Path. Comp.* No. 124. June 1916. P. 27.!

A six-year-old dog in a bad state of health was operated on for a large fibro-sarcoma of the axilla weighing 150 grammes. The enormous operation wound closed in eight days on treatment with Delbet's solution (solution of chloride of magnesium, 12·10 in 1000).

RETTERER, E., and VORONOFF, S. "The Ultimate Fate of Grafted Articulations" (Évolution éloignée des greffes articulaires). *C. R. Soc. Biol.* Vol. LXXIX., No. 17. 4th November 1916. Pp. 918-921.

The fourth metatarso-phalangeal articulation of an adult dog was replaced by the second articulation of the same foot. The operation was performed on the 23rd of July, and on the 26th September the animal could walk without the least lameness. The joint appeared supple and elastic. Examination at the end of one year showed that the bony and cartilaginous tissues had a complete cartilaginous covering of which the deep zone was vascular, the middle zone appeared normal, and the superficial zone bristled with prolongations of cartilage in course of regression.

STOKER, G. "The Surgical Uses of Ozone." *Lancet.* Vol. CXI, No. 4860. 21st October 1916. P. 712.

The properties of ozone, which have a wonderfully healing effect, are, as far as one can say at present, three—

1. It is a strong stimulant, and determines an increased flow of blood to the affected part.
2. It is a germicide which destroys all hostile micro-organic growth.
3. As the French chemist Hennocque has shown, it has great powers in the formation of oxyhaemoglobin.

WADSWORTH, W. J. "Observations on the Treatment of Fistulous Withers." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 1. October 1916. Pp. 47-51.

The method of treatment herein suggested is as follows:—"Plunge the knife into the tumour about 2 ins. and in one sweep bring it down in front of the anterior angle of the scapula into the neck. Repeat the cut on the other side, and force the knife through the neck to the first cut. Wash out the fluid, calcareous particles and discoid bodies, if there are any, with any disinfecting or antiseptic solution, and let the wound alone thereafter."

WESTON, T. A. "Report on One Hundred and Seventy Cases Operated upon under Spinal Anæsthesia." *Brit. Med. Journ.* No. 2919. 9th December 1916. Pp. 794-795.

The average time required to produce anæsthesia of the abdomen and lower limbs after the spinal injection of Barker's stovain-glucose solution was three and a quarter minutes. The operations reported ranged from appendicectomy and amputation of the thigh to circumcision.

The principal advantage claimed for spinal anæsthesia is the perfect relaxation in abdominal and rectal operations. The portability of the necessary apparatus and the possibility of dispensing with the services of an anæsthetist are also great advantages. Shock and respiratory disturbance are also greatly diminished.

WOOLDRIDGE, G. H. "Local Anæsthesia." *Vet. Journ.* Vol. LXXII., No. 495. September 1916. Pp. 292-298.

YATES, G. "Interdigital Abscess." *Vet. Record.* Vol. XXIX., No. 1476. 21st October 1916. Pp. 165-166.

The case occurred in a spaniel. The abscess contained a streptococcus, staphylococcus, pyogenes aureus, and a bacillus of the diphtheroid type.

TERATOLOGY.

KIRKHAM, W. B., and HAGGARD, H. W. "The Anatomy of a Three-legged Kitten." *Anat. Record.* Vol. X., No. 8. 20th June 1916. Pp. 537-542. 3 Figures.

KORNDER, L. H. "An Anomalous Urinogenital System in a Dog." *Anat. Record.* Vol. XI., No. 1. August 1916. Pp. 19-24. 2 Figures.

In the specimen described the ureters opened into the cornua of the uterus about a centimetre below the place where the uterine tubes of Fallopian emerge. The uterine epithelium was pseudo-stratified instead of being high.

columnar as in the normal organ. The deep glandular epithelium, however, was the same as in a normal uterus. The embryological significance of the anomaly is considered.

MOUSSU, G. "Anomaly of the Heart of a Dog" (Anomalie du cœur chez le chien). *Rec. Méd. Vét.* Vol. XCII., No. 15-16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 466-470. 2 Figures.

WHITE, P. B. "On a Case of Holocordius Acephalus in a Bird." *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 3. September 1916. Pp. 199-201. 2 Figures.

The specimen was hatched from the same egg as a normal duckling, and externally consisted of very little more than a pair of hind limbs.

TOXICOLOGY.

BIBBEY, H. "Poisoning by Veratrin." *Vet. Record.* Vol. XXIX., No. 1478. 4th November 1916. P. 185.

Symptoms of poisoning were produced by the administration of 2-drachm doses of Bruasco's cough mixture.

GRAHAM, R., and HIMMELBERGER, L. R. "Studies in Forage Poisoning." III. *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 2. June 1916. Pp. 107-116.

HANCOCK, R. C. G. "Notes on an Outbreak of Poisoning among Horses." *Vet. Journ.* Vol. LXXII., No. 494. August 1916. Pp. 258-262.

Apparently cases of yew poisoning. Out of seventeen horses affected five died.

MARSH, C. W., and CLAWSON, A. B. "Larkspur Poisoning of Live-Stock." *Bull. No. 365.* U. S. Dept. of Agric. Pp. 1-91. 15 Plates, 5 Text Figures.

SCOTT, W. J. M. "Experimental Mitochondrial Changes in the Pancreas in Phosphorus Poisoning." *Amer. Journ. Anat.* Vol. XX., No. 2. September 1916. Pp. 237-253. 1 Plate, 7 Figures.

STOCKMAN, S. "Cases of Poisoning in Cattle by Feeding on Meal from Soya Bean after Extraction of the Oil." *Journ. Comp. Path. and Therap.* Vol. XXIX., Pt. 2. June 1916. Pp. 95-107.

"Strychnin Poisoning in the Dog." *Vet. Record.* Vol. XXIX., No. 1483. 9th December 1916. Pp. 237-238.

The animal recovered under treatment, which included chloroform anaesthesia and injections of morphin and atropin.

WILLIAMS, W. L. "Lead Poisoning in Calves." *Cornell Veterinarian.* Vol. VI., No. 3. July 1916. Pp. 116-128.

Eight cases of lead poisoning are described with the object of indicating a somewhat unexpected source of lead. "This group of cases is apparently a highly important one. It seems exceedingly difficult for us to keep in mind the great variety of symptoms which lead in small amounts may cause in cattle. It is yet more difficult to keep constantly in mind the danger from painted wood to which cattle have access. It is almost impossible to make certain that a cow or calf cannot get at an old painted board. . . . Some cattle lick objects, and some do not. Young calves habitually lick objects." It was concluded that the calves described in the present paper obtained the lead by licking painted boards.

TREATMENT.

CHIBAY, M., and BOURUIGNON, G. "Ionisation in the Treatment of Adherent Cicatrices" (L'ionisation dans le traitement des cicatrices adhérentes simples ou compliquées de contractures des membres). *La Presse Med.* No. 43. 3rd August 1916. Pp. 337-339. 7 Figures.

Ionisation with iodide of potassium profoundly and rapidly modifies bad and adherent cicatrices even when these are of very old standing.

DESCAZEUX, J. "Treatment of Mange" (Traitement de la gale). *Rec. Méd. Vét.* Vol. XCII., No. 14. *Bull. Soc. Centr. Méd. Vét.* 30th July 1916. Pp. 227-237. 1 Figure.

DOUVILLE. "Treatment of Epizootic Lymphangitis with 'Galyl'" (Traitement de la lymphangite épidémiologique. Essais par le galyl). *Rec. Méd. Vét.* Vol. XCII. *Bull. Soc. Centr. Méd. Vét.* 30th May to 30th June 1916. Pp. 144-151. 4 Coloured Plates.

The intravenous injection of "galyl" in doses of 2 to 3 grammes in a 1 per cent. solution. The injection is repeated at the end of fifteen days, the dose being weaker or stronger, depending upon whether the case shows signs of improvement or the contrary. Fifteen horses were so treated, and eleven were cured. The other four animals were destroyed after a month in hospital on account of the gravity of their condition.

The author has also tried injections of iodide of potassium (Teppaz) with satisfactory results.

Injections of "novarsenobenzol" were given to twelve animals, seven of which appeared on the way to recovery.

FREMONT-SMITH, F. "Treatment of Diabetes." *Bost. Med. and Surg. Journ.* Vol. CLXXV., No. 14. 5th October 1916. Pp. 476-479.

The value of "fasting days" is insisted upon.

MACDOUGALL, R. S. "Insects and Arachnid Pests of 1915." *Trans. High. and Agric. Soc., Scot.* Vol. XXVIII. 1916. Pp. 107-139. 13 Figures.

The author recommends the following dressings for use against *Hæmatopinus asini* (*macrocephalus*) and *Trichodectes parumpilosus* (*equi*) on horses:—(1) Arsenious acid, 1 oz.; soft soap, 2 ozs.; carbonate of soda, 1½ oz.; water, 2 pints: diluted to 5 gallons before use. (2) 2 per cent. creolin solution. (3) Perchloride of mercury, 1 part in 1000 parts of water, for use on the legs only.

For sarcoptic, psoroptic, and symbiotic mange in horses the following compounds are suggested:—(1) Sulphur, oil of terebinth, spirits of tar, and liquor potassm, 1 oz. of each; rape oil, 1 pint. (2) Sulphur, 2 parts; potassium carbonate, 1 part; sperm oil, 8 parts.

SALVISBERG. "Note on the Treatment of Coccidiosis of Cattle" (Beitrag zur Behandlung der Coccidieneruhr des Rindes). *Schweiz. Arch. f. Tierheilk.* Vol. LVIII., No. 7. July 1916. Pp. 369-373.

TUBERCULOSIS.

ADRIANCE, V. "Tubercular Infection in Infancy and Childhood." *Bost. Med. and Surg. Journ.* Vol. CLXXV., No. 7. 17th August 1916. Pp. 215-220.

Infection with the bovine type of tuberculosis occurs mostly in infancy and childhood, while the human type is chiefly manifested in adult life. The bovine type manifests itself chiefly in disease of the bones and lymph-glands of the neck and mesentery. There is a possibility that the milk of immunised cows may be useful in the prevention and treatment of tuberculosis in the human. Pasteurisation of milk should be generally adopted.

CHAUSSE, P. "Tuberculosis of the Seminal Vesicles, Diferent Duct, and Urethra of an Ox" (Une observation de tuberculose des vésicules séminales, du canal déférent et de l'urètre chez un bœuf). *Rec. Méd. Vét.* Vol. XCII., No. 13. 15th July 1916. Pp. 397-408. 3 Figures.

— "A Case of Caseous Pneumonia of Respiratory Origin in the Pig" (Sur un cas de pneumonie caséuse porcine d'origine respiratoire; considérations relatives à la pathogenie et à la pathologie comparée). *Rec. Méd. Vét.* Vol. XCII., Nos. 15-16. *Bull. Soc. Centr. Méd. Vét.* 15th August to 15th September 1916. Pp. 445-460. 3 Figures.

HART, G. H. "The Combined and Follow-up Systems of Tuberculin Testing." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 2. November 1916. Pp. 189-208. 3 Tables.

MARKUS, H. "Transmission of Tuberculosis from the Pig to Man. Re-inoculation into the Calf" (*Transmission de la tuberculose porcine à l'homme. Réinoculation au veau*). *Rev. Gén. Méd. Vet.* Vol. XXV., No. 298. 15th October 1916. Pp. 466-478. 3 Figures.

MILLER, A. H. "On Certain Reactions of the Tuberclle Bacillus to Sperm Oil and its Constituents." *Journ. Path. and Bact.* Vol. XX., No. 4. April 1916. Pp. 395-407. 1 Plate, 3 Figures.

The tubercle bacillus grown on sperm oil media is converted into "banded" and "beaded" forms. This is also shown in its first stages on olive oil medium. It appears to be due, in part at least, to the presence of unsaturated fatty acids in the form of esters.

SEDDON, H. R. "On Subcutaneous Tuberculosis in Bovines." *Vet. Journ.* Vol. LXXII., No. 496. October 1916. Australian Supplement. Pp. 33-37.

VETERINARY REVIEW.

SPECIFIC POLYARTHRITIS.

THE literature on this subject is now considerable, and in recent years articles dealing with it have frequently appeared in the periodicals of this and other countries. This is not to be wondered at, when one considers the prevalence of the disease and its death-dealing effects on the young of the equine race. The loss it occasions is in no small measure responsible for the shortage of horses which is so deplorable at the present time.

The disease is known under different names. Those commonly used are :—“Joint-ill,” “navel-ill,” pyæmic arthritis, pyæmic umbilical infection, while the French use the term *arthrite de nouveau-nés*, and the Germans *Lähme* (limping).

It is over a hundred years since the malady was first described in veterinary literature by Brugnone of Turin in 1781. The first account of it in English works was given by Pritchard of Wolverhampton in *The Veterinarian* in 1832, and Percival referred to it in *Hippopathology* in 1849. At this time the infection was believed to be caused by alterations in the milk of the dam, brought on by work and overheating. Recently the opinion has been expressed that in some cases infection may result from the milk being infected by micro-organisms, and this idea of milk infection is held by some prominent breeders, who will not make use of a foster-mother whose foal has succumbed to polyarthritis. The malady occurred as an enzootic in Germany and Hungary in the middle of last century. Bollinger investigated an outbreak in the Government stud at Graditz, Silesia, in

1869, and made further researches in 1873-75,¹ and it was he who first threw light on certain aspects of its etiology by showing that infection occurred by way of the umbilicus. Penberthy² in England, Gmelin,³ Pfeiffer,⁴ and Sohnla⁵ in Germany, and Nocard in France, are amongst those who have studied the disease in more recent times.

The etiology of specific polyarthritis is, however, by no means fully understood. In dealing with this question we may view it from several standpoints.

Predisposing Causes.—The most obvious predisposing cause is the presence of a fresh wound at the stump of the umbilical cord. Umbilical cords vary in dimension and character; some are thick and gelatinous, while others are thin and attenuated. The latter wither and drop off more quickly than the former. Subjects with this type of cord are said to be more immune to the disease than those possessing the former type of cord, where healing is slow and the opportunity for infection of the thrombi within the divided vessels all the greater. One often observes that the stump, or amniotic portion of the cord, in affected subjects is abnormally short—so short, indeed, that there is nothing more than room for a ligature. Again, any condition which tends to retard healing of the umbilicus must be looked on as a predisposing cause. The umbilicus frequently comes in contact with a dirty floor or filthy bedding. In colt foals it is frequently soiled by urine, owing to the proximity of the penis; while in previous urachus its tissues become saturated with urine, hence the greater prevalence of the disease in colt foals and in those suffering from previous urachus. The breed also has a marked influence. The malady is most frequently met with in foals of the heavy breeds. Clydesdales and Shires are especially liable to it, while in Shetland ponies its occurrence is rare.

¹ Virchow's *Arch. f. path. Anat. u. Phys. u. f. klin. Med.*, 1873, vol. lviii. p. 329.
Deutsche Zeitschr. f. Tiermed. u. vergl. Path., 1875, vol. i. pp. 50-239.

² *Vet. Record*, No. 1059, 24th October 1908.

³ *Monatsschrift f. prakt. Tierheilkunde*, 1891, vol. ii. (translated in *Journ. Comp. Path. and Therap.*, March 1892).

⁴ *Arch. f. wissenschaftl. u. prakt. Tierheilkunde*, 1891, vol. xvii.

⁵ *Monatsschrift f. prakt. Tierheilkunde*, 1901, vol. xii.

In-breeding and line-breeding seem to have a predisposing influence, for in the Clydesdale breed it is most marked in pure, choicely-bred foals. So prevalent is it at times in this breed that certain breeders in a particular season have been unable to rear a single foal. The percentage of cases in early foals is greater than in those born late in the season. This can partly be accounted for by the necessity of having to keep early foals indoors for a number of weeks in boxes that are sometimes not kept particularly clean, a condition which increases the possibility of postnatal infection. The length of the period of gestation has also an influence. Foals carried two to three weeks over their time are generally less frequently affected. Penberthy¹ first pointed out that subjects of polyarthritis are frequently born before the end of the normal period of gestation. He noted that twenty-seven out of sixty-one were born before. We entirely agree with his assertion on this point, as well as with the assertion that these are often weakly at birth and succumb in a few days. We are also of opinion that in most of these cases the infection is prenatal—a point to be considered later. No doubt, as with other diseases, a predisposition may be inherited from the dam. A more important fact, however, has been noted ; namely, that the malady is very frequently met with in foals whose dams have suffered from such conditions as influenza and strangles shortly before parturition. Animals suffering from strangles and suppurating wounds may also infect the foaling boxes with pus organisms. Again, we have frequently noted that certain mares, kept under the best hygienic conditions, habitually give birth to foals which die of polyarthritis, and such foals may or may not be sired by the same stallion. This fact has given rise to the opinion, now very prevalent, that in the majority of these cases the infection is prenatal, and a haematoogenous infection from the dam. It has also been shown² that there is an intimate relation between contagious abortion in mares and

¹ *Vet. Record*, No. 1059, 24th October 1908.

² Turner, mentioned in Friedberger and Fröhner's *Comparative Pathology and Therapeutics*.

polyarthritis in foals, and organisms have been isolated from the membranes similar to those found in the lesions in foals. The stallion, too, is not above suspicion, although up to the present he has not been proved to be directly responsible in any specific case. We remember, however, an instance where fifteen foals sired by one district stallion died in one season, and the total number of foals left by him that season would have been about sixty. Two of the cases occurred at a farm where the disease was unknown before, and both mares have since reared healthy foals. Both the affected foals died under three days.

Exciting Causes. — Various micro-organisms have been isolated from the lesions and credited with being the causal agents. In most cases types of the *Streptococcus pyogenes* and the *Staphylococcus pyogenes aureus* can be found, while frequently the *Bacillus coli communis* and occasionally the *Bacillus pyocyaneus* have been isolated from the lesions. These organisms are ubiquitous in nature. They may produce very varied results under different conditions, and their virulence may be greatly modified. Dr. Schofield¹ in a report to the Minister of Agriculture, Dominion of Canada, on experiments on polyarthritis carried out in 1915, states that a haemolytic streptococcus is very closely related to the disease; and further, that organisms similar to those isolated from the joints of affected foals were found in the milk of the dam. It has not yet been proved, however, whether the rôle of these pus-producing organisms is primary or secondary. In connection with the occasional presence of the *Bacillus coli communis* in the lesions we are of opinion that there is a close relationship between the disease in question and diarrhoea and gastro-intestinal disturbances which in young, highly-bred foals is very common, generally serious, and often fatal. According to Lignières² and others, an organism of the fowl-cholera type, a *Pasteurella*, is believed to be the real cause of the malady, while some consider that its action is assisted by the presence of the *Bacillus coli*.

¹ *Vet. News*, 25th November 1916.

² Mentioned in F. Wallis Hoare's *System of Veterinary Medicine*.

communis. Gmelin¹ discovered the *Micrococcus tetragenus*, or an organism almost morphologically identical with it, in the lesions. From the above statements it is evident that an investigation into the exact bacteriology of polyarthritis is highly necessary for the purpose of ascertaining whether the disease is caused by a specific micro-organism, or whether it is a mixed infection, or whether a number of conditions may not be classified under this title.

Natural Infection.—Although prophylactic treatment of the umbilicus at birth has greatly reduced the number of cases of this disease in different studs, yet the results are far from satisfactory. We have personally carried out this treatment with the greatest possible care, at and after birth, but often to no purpose; while certain breeders have built new boxes of approved type, disinfected them scrupulously, and have carried out the umbilical treatment to the utmost of their ability; and yet the disease has developed. For this reason, as well as for others, one must look for more than one portal of infection. Dr. Schofield has revived the idea of infection by the digestive tract from the milk of the dam, and this may be possible, although Nocard failed to produce the disease artificially in this way in calves. From these observations we must consider natural infection as prenatal and postnatal.

Where the infection is presumed to be prenatal or intra-uterine, a haematogenous infection from the dam, it has been noted that the foals are generally born before or about the termination of the normal period of gestation, that they are weakly at birth, often unable to stand and take nourishment, and that swelling of the joints occurs in a few hours. Such cases are almost invariably fatal, and death occurs in a very short time—twenty-four hours to three to four days. The autopsy reveals pathological changes so extensive as to preclude their origin from postnatal infection. Fully formed abscesses have been found in the stifle joints under forty-eight hours, though death often supervenes before abscess formation has begun, and

¹ *Monatsheft f. prakt. Tierheilkunde*, 1891, vol. ii. (translated in *Journ. Comp. Path. and Therap.*, March 1892).

the joints and tendon sheaths are simply infiltrated with gelatinous material, or distended by a sero-fibrinous exudate. These are the types of cases which are troubling the Clydesdale breeders, and unfortunately they are far too common.

Few will deny that possibly the greater number of cases result from postnatal infection. With these there is generally a fairly lengthy period of incubation—from one to four weeks or more. The foals in general are much stronger, and a percentage will recover. The disease in such cases is due to infection of the umbilicus soon after birth, although infection during parturition from the genital passage has been mentioned. In general it results from the umbilicus coming in contact with a dirty floor or filthy bedding, as well as from the hands of an attendant, or a dirty ligature. In certain districts it is a common practice to allow mares to foal in the stable, and after the foal can walk the two are conducted to a box. This is highly dangerous, as the cord, broken or unbroken, is sure to come in contact with the contaminated uterine fluids accumulated in the gutter behind the mare.

The causal micro-organisms enter the ruptured umbilical vessels, and these begin to multiply in the thrombi which naturally form at the torn or cut ends. The umbilical vein is the principal seat. The thrombus becomes broken down and disintegrated, and septic emboli pass to the portal vein, and hence gain the general circulation to be carried to all parts of the body. Gmelin¹ states that disintegration of the coagulum may take place in the umbilical arteries, and the infective agents may pass along to the internal iliac arteries and be carried to the posterior extremities. Infection may also pass along the urachus to the bladder, there to set up cystitis, while the connective tissues of the umbilicus may be the seat of a purulent inflammation which may gather and extend to the adjacent peritoneum and set up peritonitis.

Post-mortem Appearances.—These are many and varied, as almost any organ in the body may be the seat of lesions.

¹ *Monatshefte f. prakt. Tierheilkunde*, 1891, vol. ii. (translated in *Journ. Comp. Path. and Therop.*, March 1892).

In general they are of the nature of a pyæmia. Metastatic abscess or diffuse purulent inflammation is met with in various places, particularly in the joints. In a few of the cases which have run a rapid course the changes are less marked, and resemble a general septic infection. No pus may be discovered; only a yellow, jelly-like infiltration in and around the joints and in the tendon sheaths. The umbilicus may have healed and may show no sign of disease. On the other hand, it may be swollen, tense, and moist, while on incision an abscess may be met with in the abdominal wall. A partially or wholly disintegrated thrombus will generally be found in the umbilical vein, and the vessel may be full of pus. The liver may contain one or more abscesses. Infection of the mesenteric glands is also common. The lungs are frequently affected with bronchopneumonia or septic pneumonia, and the pleural cavity may contain pus. The meninges and the anterior chamber of the eye are occasionally affected with purulent inflammation, as also are the pericardium and the peritoneum. The joints, amongst which we have noticed no special predilection, may show varied alterations. One or more may be affected. They may simply be swollen and contain a yellowish flocculent exudate, or they may be the seat of an abscess. The abscess may be open and the joint cavity exposed. The synovial lining is generally thickened and congested, while the articular cartilages may be ulcerated, and in a long-standing case the bones themselves may be diseased.

Symptoms.—These are also varied. General systemic disturbances may manifest themselves first, or swelling of a joint may precede these. At the outset of the general symptoms the animal is noticed to be uneasy. It shifts the weight from one leg on to another, giving an occasional swish of the tail. This is followed by depression, high fever, short breathing, rapid pulse, loss of appetite, and a desire to lie down most of the time. In subjects where the disease appears soon after birth, and where we presume the infection to be prenatal, these may be the only symptoms. Death ensues rapidly, before there is any evidence of pus formation in

any part of the body, and the case resembles one of septicæmia.

In the more common type the animal soon becomes lame, and a joint will be found swollen. The swelling may disappear from one joint and attack another; pus formation, and more or less destruction of the joint tissues, ensues. The umbilicus itself may have healed, or it may be swollen and moist, and pus may be squeezed from the still patent opening. Diarrhoea or gastro-intestinal irritation frequently precedes or accompanies the general symptoms, and this, as already mentioned, may be in some way connected with polyarthritis. The common type of the disease is of the nature of a pyæmia. The symptoms are less acute, the duration is longer (from one to two weeks), and in most cases the infection is presumably postnatal.

Prophylaxis.—The prophylaxis has been so often so carefully described that it is only necessary to touch on certain aspects. Some would have us believe that if prophylactic measures are carefully carried out the disease can be absolutely prevented. That is far from our experience. We have carried out prescribed prophylactic measures in minute detail at and after birth, and yet the disease has followed. Nevertheless, these are of the utmost importance in preventing postnatal infection.

We prefer a special foaling box which has been thoroughly cleaned and disinfected by spraying with a strong *liquid* disinfectant. We object to lime being mixed with the disinfectant, as it prevents the liquid from penetrating thoroughly into every hole and crevice. As bedding, we prefer clean pine sawdust to the depth of 3 or 4 inches, as this substance absorbs the fluids from the mare, is antiseptic, and cannot be easily scraped away to expose the floor underneath. The mare should be housed in another building and watched continuously. Immediately before foaling, the external genitals, thighs, and udder should be washed with a disinfectant. When the first pain is manifested she should be taken into the specially prepared box, and in a short time the foal will be dropped on the clean sawdust, or may be caught on

a boiled sheet or tarpaulin. The cord will be either broken or intact. If broken, it may be bleeding, and if so, it should be allowed to bleed, in order, as far as possible, to empty the arteries and the valveless vein. If the cord is intact and the dam recumbent, time should be given for the pulsations in the cord to stop. The part should then be washed with a sublimate solution, and an aseptic ligature applied firmly on the whitish amniotic portion about a quarter of an inch from its union with the general integument. The intact cord should then be severed at the constriction or nick below the ligature. It is well also to ligature the cord attached to the membranes, as this facilitates their expulsion by retaining blood in the chorionic villi. Different recommendations for the subsequent treatment of the umbilical stump are given. Gmelin¹ advised painting the stump daily with pure carbolic acid, and after four or five days, when it becomes dry and parchment-like and transverse cracks are evident, it should be removed and the wound treated with a dressing of 1 per cent. corrosive sublimate in zinc gelatine. Nocard² advised washing the stump with Lugol's solution, then with 2 parts of iodine in 1000 parts alcohol, and finally sealing it with 1 per cent. iodine in collodion. We have used mostly either pure carbolic acid or strong tincture of iodine, while in calves, after disinfection, we have found tar most effective.

Treatment. — This is, as a rule, most unsatisfactory. Possibly every known internal antiseptic has been used, but with disappointing results. When constitutional disturbance is severe, more than one limb affected, and the animal unable to move about, treatment is hopeless. Where only one limb is affected and the general symptoms are not severe, treatment may be tried. For the general symptoms iodine, potassium iodide, salicylate of soda, quinine, and hyposulphate of soda, along with stimulants, are all commonly used. Many

¹ *Monatshefte f. prakt. Tierheilkunde*, 1891, vol. ii. (translated in *Journ. Comp. Path. and Therap.*, March 1892).

² Mentioned in Hutyra and Marek's *Special Pathology and Therapeutics of Domesticated Animals*.

practitioners have faith in nuclein. We have found this substance useful for reducing fever and improving the appetite. If an abscess is present at the umbilicus, it must be opened and the cavity thoroughly disinfected. Some inject a strong solution of carbolic acid into the connective tissues of the part with a view to localising the infection, while others recommend acetozone. When the joints become swollen, Scott¹ recommends aspiration to reduce tension and minimise intra-articular destruction. Abscesses should be opened as early as possible and irrigated with disinfectants. When there is no tendency to suppuration belladonna liniment may be used to alleviate the pain.

Vaccines and Sera.—Seeing that the bacteriology of the disease is not yet definitely settled, these substances cannot be looked on as specific. Specificity, however, is relative, and while we admit that the use of these products is partly empirical, yet we deny that it is pure quackery, as some would have us believe. Such a treatment in all mixed infections is partly empirical but nevertheless often useful.

Proprietary stock vaccines and sera have been on the market for some time, and have been employed fairly extensively. They are said to be derived from organisms isolated from polyarthritic lesions. The vaccines are a combination of devitalised *Staphylococcus pyogenes aureus* and *albus* and *Streptococcus pyogenes*, and sometimes others, while the serum used is mostly antistreptococcus polyvalent. They can be employed with perfect safety, and foals a few hours old will withstand large doses of devitalised vaccines, up to 5,000,000, at twenty-four hours after birth. The substances are used in various ways. Some administer vaccines or sera to mares from a fortnight to a month before foaling with a view to immunisation. Internal antiseptics, such as salicylate of soda, are also employed. Within twenty-four hours after birth the foal receives a dose of vaccine or serum with the same end in view, and we know that in many studs, although the results have not been ideal, as is to be expected, yet they are a marked improvement on what obtained before this

¹ *Clinical Bacteriology and Vaccine Therapy*, p. 108.

treatment was employed. Vaccines and sera are also used in treatment, but here the results seem to vary widely. Possibly they may be useful in cases where the disease is of a mild type and the lesions few, but where the disease rapidly becomes generalised we are of opinion that no treatment is of much avail. A few practitioners have recently been employing autogenous vaccines in treatment with a considerable amount of success. Schofield, in the report already referred to, claims to have reduced the mortality by vaccine treatment from 66 per cent. to 25 per cent., and when the vaccine was used at birth, along with other prophylactic treatment, it reduced the number of cases.

A new method of treatment is described by Gerhardt,¹ who favours the view of antenatal infection. He concludes that there are certain substances in the blood of the mare which inhibit the disease in the foal before birth. After birth, when these substances are no longer transmitted to the foal, the disease may develop. He therefore collects serum from the mare in the ordinary way, and administers it on the first appearance of symptoms to the foal in doses of 200 to 300 c.c., either subcutaneously or intravenously.

Whether the action of the ever-present pus organisms be primary or secondary, vaccines or sera made from those found in the lesions should modify or control that action, in the same way as vaccines made from pus organisms found in a tubercular pulmonary cavity minimise pulmonary tissue breakdown. For the same reason coli vaccine or serum may be of value where intestinal disturbance accompanies the disease.²

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¹ *Berliner tierärztl. IVochenschr.*, 25th March 1916.

² Since the above was written, Hardenbergh (*Journ. Amer. Vet. Med. Assoc.*, 1916, vol. 1, p. 331). See this *Review*, 1917, Vol. I. p. 126), as the result of observations during an outbreak of contagious abortion in a large stud of thoroughbred mares, is of the opinion that vaccination with abortion organisms may confer some immunity upon foals and may even have curative properties.

ABSTRACTS.

ANATOMY (Including Embryology).

THE GLANS PENIS AND PREPUCE OF THE BULLOCK (De la conformation et de la texture du gland du bœuf). E. RETTERER and H. NEUVILLE. *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 993-996. (De l'évolution des téguments glandulaire et préputial du bœuf.) E. RETTERER. *Ibid* Pp. 996-1000.

As compared with the glans of the penis of the bull, that of the bullock is slightly flattened from above to below. The spiral described by the distal part of the corpus cavernosum is less pronounced in the bullock, and the urethral papilla (process) is consequently directed downwards so that the urethra opens on the inferior surface of the glans.

Cartilaginous cells were found in the tunica albuginea of the terminal part of the penis of each of the bullocks examined. There was also a considerable production of adipose tissue in the corpus cavernosum.

The mucous investment of the glans and prepuce is also very different in the bull and bullock. In the bull it is beset with a multitude of fine, long papillæ; while in the bullock it is uniformly undulating. In the bullock the epithelium is thinner and forms intra-dermal ridges or laminae.

A NOTE ON THE MORPHOLOGY OF THE SEMINIFEROUS TUBULES OF BIRDS.
G. CARL HUBER. *Anat. Record.* Vol. XI, No. 4. November 1916. Pp. 177-180. 1 Figure.

In 1913 Huber and Curtis found that in the mammalian testis the seminiferous tubules presented no blind ends, diverticuli, or nodular enlargements, but were arranged in the form of an arch or a variable number of linked arches, all of which terminated in the tubuli recti.

leading to the rete testis. The observations have been extended to the testis of the bird. Repeated examination of teased material taken from the testis of the adult domestic fowl have shown that the mammalian arrangement does not obtain. The seminiferous tubules of the bird are arranged in the form of a network, with a varying number of anastomoses at different levels of the gland substance.

The method of preparation of the material was as follows:—A 75 per cent. solution of HCl was injected into the aorta central to the branches supplying the kidneys and sex-glands. The testes were removed and placed in a 75 per cent. solution of HCl in order to obtain thorough maceration preparatory to teasing. The macerated pieces were thoroughly washed in distilled water, stained in hæmalum, softened and cleared in 0·25 per cent. to 0·5 per cent. ammonia water, in which they were then teased.

It appears that the reticular arrangement of the seminiferous tubules is an embryonic condition, lost in the development of the mammalian organ, but retained in birds. In a cryptorchid rabbit, described by Huber and Curtis, extensive anastomoses of testis tubules were observed in two regions of the tubule complex. This, taken with the arrangement in the bird, seems to suggest a relatively late complete morphogenesis of the seminiferous tubules of the mammal.

DIETETICS.

PALM-KERNEL CAKE, PALM-KERNEL MEAL, AND COCO-NUT CAKE
COMPARED WITH SOYA CAKE FOR FATTENING CATTLE, YOUNG
STORE CATTLE, AND FATTENING SHEEP, 1915-1916. D. A.
GILCHRIST. *Bull. No. 25.* County of Northumberland Agric.
Exp. Station, Cockle Park. 1916. Pp. 1-8. 5 Tables.

The tables giving the gains with fattening cattle show that there was little difference between the four rations, and the result indicates that the three tested feeding-stuffs are valuable additions to the feeder's choice of foods. With young store cattle equally satisfactory results were obtained, and it is interesting to note that palm-kernel meal gave a better return than did palm-kernel cake, though the former contained less than 2 per cent. of oil and the latter nearly 6 per cent. With fattening hoggs the three foods proved quite successful, and again palm-kernel meal gave a better result than did the cake. Attention is drawn to the fact that the palm-kernel foods kept well in an ordinary granary and were in quite good condition

after more than six months' storing. Stock will take to the palm-kernel cake if it is introduced gradually, if no surplus is left to become stale in the troughs, and if it is judiciously fed and mixed with other foods.

(R. G. L.)

THE METHOD OF FEEDING COWS GIVING MILK INTENDED FOR INFANTS

(La régime alimentaire des vaches fournissant du lait destiné

aux nourrissons). R. RAIMONDI. *La Presse Méd.* No. 47.

24th August 1916. Pp. 369-371.

It is well understood that the feeding of cows should vary according as the milk is intended for butter or cheese-making or for the feeding of infants. Great importance is attached to the supervision of the feeding of cows when their milk is intended for the nourishment of infants. The following foods are recommended for this latter purpose:—Dry hay, barley meal, oats and maize, with chaff and wheat bran for the winter months and a certain quantity of mangold and potatoes. During the summer, green fodder should be given, but must be introduced gradually so as not to bring about a sudden change in the composition of the milk. Two suggested methods of feeding are given in detail, and emphasis is laid on the value of wheat bran in the ration owing to the contained phosphates. The purity of the cows' drinking water is insisted on, and the quantity allowed and the periods of giving it are, according to the author, of some importance. During cold weather the water should be given at body temperature. It is as important to know what foods have a deleterious effect on the milk as it is to know those which are satisfactory. Leaves of beet and large watery roots rich in nitrates and amides and poor in albuminoids are considered to be harmful.

The milk produced by cows fed on damaged beet-pulp has a baneful effect on infants, as also has milk from cows fed on draf, distillery dregs, and some oil cakes. The use of oil cakes in general is strongly condemned, not only because some, such as croton, castor and beechmast, are poisonous, and that these cakes are used to adulterate other cakes, but because the normal milk-fat is modified by the ingestion of the oil which is in the cakes and thereby both the nutritive value and digestibility of the milk are lowered. The milk richest in butter-fat is far from being the best for infants, and it is preferable to give infants milk containing 2 per cent. of fat rather than that containing 4 per cent. if the former is produced without oil cake and the latter with its aid.

(R. G. L.)

THE COST OF PRODUCING MILK. J. WILSON. *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVII., No. 2. January 1917. Pp. 218-224. 6 Diagrams.

The farmer is primarily a grower of crops, and his profits depend upon the kind he grows and the success with which he grows them.

In Ireland, with the exception of potatoes and flax, in some cases the whole crop, and in others part of it, is not readily marketable. The farmer's profits do not end with growing the crops; they rise or fall according to the way in which the unmarketable products are dealt with—according as these are profitably or unprofitably turned into things which are more readily marketable. In recent years inquiries have been made into the cost of producing milk, the outstanding of which are those by Crowther and Ruston of Leeds University from 1911-1915. Their object was to find the cost of the food used in producing a gallon of milk, first, by all the cows in a herd, and next, by each individual cow. From Crowther and Ruston's table (here given) it is obvious that the cost of food per gallon of milk runs contrary to the total yield: the cost being low when the yield is high, and high when the yield is low.

By means of graphs the author shows that for cows of equal yields the costs of production per gallon are parallel, no matter when the cows may calve. Among 800-gallon cows the cost is about 4d. per gallon with the best farmers, and up to 6½d. with the worst. For 600-gallon cows the costs run from 5d. to 8d. In graphic form is shown the cost of milk production by the least efficient and by the most efficient farmers for cows of varying capacities. The author shows how the true cost of milk production can be found by means of the Scandinavian method of food valuing. "When milk is returning 5d. a gallon the best farmers make no profit with cows giving 600 gallons a year, and lose with every cow giving less. On the other hand, the very worst farmers lose with even the very best cows. Their unmarketable products are converted into things which are marketable, but at a loss." Attention is drawn to the importance, from a national point of view, of considering the waste which results from low-yielding cows and inefficient farmers. Since feeding is cheaper in summer, winter milk might be expected to cost more than summer milk. This is not so, and the explanation is that winter-fed cows produce enough extra milk to make up for the extra feeding. (R. G. L.)

PALM-KERNEL CAKE AND MEAL AS FOOD FOR PIGS. C. CROWTHER. *Journ. Board Agric. and Fisheries.* Vol. XXIII., No. 9. Pp. 850-859.

This experiment was supervised by the author at the request of the Directors of the Board of Agriculture and Fisheries, and was for the

purpose of testing palm-kernel cake and palm-kernel meal against a food-stuff of similar composition and commonly used for feeding pigs; for this purpose "thirds" or "fine sharps" was selected. Chemical analyses of these three foods are given. On their chemical analyses, and assuming that the three foods have an equal digestibility, it would be expected that "thirds" would prove slightly superior to palm-kernel cake and considerably so to palm-kernel meal. The experiment lasted for twenty-four weeks, the first four weeks of which was the preparatory period. Fifty-four pigs, about sixteen weeks old, chiefly large whites, were carefully selected. During the first four weeks the pigs were all fed alike with the object of testing the selection of the lots by noting the gains made: during this period there was an average gain of 4·7 to 6·1 lbs. per pig per week. By final selection and allocation there were arranged three lots of three pens each, and each pen contained six pigs. All the pens were fed the same basal ration, but the pigs of one lot were given in addition thirds, in another palm-kernel cake (ground to a fine meal), and in the other extracted palm-kernel meal. An equal quantity by weight of each food-stuff was given, so that it was possible to test the efficiency of equal weights of the three food-stuffs when added to the basal ration.

While great care was taken to secure uniformity in feeding capacity of the three lots during the preparatory period it was decided, in order to still further attain this object, that the ration should be changed about at the end of each month so that each lot received one of the trial feeding-stuffs in turn. A table explaining this method is given. The cake and the meal were fed at the maximum proportion of two-sevenths of the whole ration; when this amount was increased scouring occurred. An outbreak of swine fever on the premises temporarily checked the smooth conduct of the experiment; not that the experimental pigs contracted the disease, but because it was necessary to treat them with serum as a preventative. From monthly weighings of the pigs it was found that there was considerable variation between the various pens but that the lots were fairly comparable.

During the period of five months the average gain of the lots—grouped according to feeding—for the three food-stuffs was—Palm-kernel cake, 192·2 lbs.; palm-kernel meal, 180 lbs.; and for thirds, 203 lbs. per pig. The pigs which were fed with thirds therefore gained 11·4 lbs. per head more than those fed on palm-kernel cake, and 23·6 lbs. more than those fed on palm-kernel meal. Owing to certain irregularities among the various pens the author does not wish it to be thought that these relative gains are in any way a standard comparison of the feeding values of the respective food-stuffs; rather to conclude that "the thirds have proved slightly superior to the palm-kernel cake,"

and appreciably superior to the extracted palm-kernel meal," which conclusion coincides with the expectation previously stated. The average monthly cost of feeding per pig was—Palm-kernel cake, 10s. 7d.; palm-kernel meal, 10s. 6d.; and thirds, 11s. 7d., and the average cost of food per lb. live-weight increase for the whole period was—Palm-kernel cake, 3·30d.; palm-kernel meal, 3·50d.; and thirds, 3·41d. It would seem that compared with the price paid for thirds, the palm-kernel cake was cheap and the palm-kernel meal dear. The author again draws attention to certain irregularities in the records of gains, and suggests that were the experiment to be repeated the numerical results might differ, but that it is more than likely that the order of merit of the three foods would be the same, and concludes that palm-kernel cake and palm-kernel meal can be safely used as food for pigs in a proportion ranging up to almost one-third of the total food-supply. Palm-kernel cake produced a rate of gain almost but not quite equal to that obtained with thirds; extracted palm-kernel meal was appreciably inferior. At the price paid the cake was somewhat cheaper than the thirds, but the meal did not justify its price. The appearance, flavour, and general quality of the meat obtained by the use of palm-kernel foods was proved in every way to be satisfactory.

(R. G. L.)

GENERAL.

THE PRESENT AND FUTURE MEAT SUPPLY AND THE QUESTION OF THE
FREE IMPORTATION OF CANADIAN CATTLE. THOMAS PARKER.
1916. Pp. 1-35.

This subject is dealt with not as a war expedient, but with the idea of drawing attention to the urgent necessity for devising means of combating the serious menace to the United Kingdom of a growing increase in the shortage of meat food supplies. From the arguments adduced it would appear also to be intimately associated with the question of cheaper wheat and therefore cheaper bread. Moreover, were action taken on the lines indicated regarding certain industries having a direct bearing upon the manufacture of the products of slaughtering of cattle—other than meat—the country generally, in the opinion of the author, would benefit materially.

The paper is dealt with principally under the following headings, namely :—

- (i.) Reasons why meat was getting dearer before the war.
- (ii.) Reasons for very high prices during the war.
- (iii.) How to provide for the future.

Under the first two and the beginning of the third it is explained that during the past thirty years, whilst the population of the United Kingdom has increased by nearly one-third, the cattle have only increased by about one-eighth; that sheep have decreased by rather more than 6 per cent., and swine by about 15½ per cent. It is also pointed out that the imports of live stock have decreased during the past twenty years from about half a million each of cattle and sheep down to practically nothing. Again, in dealing with the total imports of beef, mutton, pork, bacon, hams, etc., although a large increase during the past twenty years is noted, it is pointed out that the greater part of that increase occurred during the first eight years, and that during the past twelve years the imported meat supplies remained nearly stationary. It is therefore clearly indicated that, after deducting exports, during the twenty years ending 1913, whilst on the one hand the total annual supply of meat in the United Kingdom has increased, the total supply per head per annum has, on the other hand, owing to the proportionately greater increase of the population, decreased: hence the rise in price.

The author then goes on to show how the war has aggravated the position, causing the prices to rise by leaps and bounds; in fact, within a few months hurried us on to that stage—besides arresting public attention—which in normal times would have taken years.

After dealing with the production within our home herds, the Maintenance of Live Stock Order of 1915, and the huge increase of acreage placed under permanent pasture during the past thirty years, the sources from which to obtain frozen and chilled meat are dealt with rather fully. The last part of the paper deals exclusively with the importation of live animals, and, to be exact, is a discussion on the question of the free importation of Canadian cattle.

To review this section fully would occupy too much space. Briefly, however, according to the author, Canada appears to be the one country in the world outside the United Kingdom, the Channel Islands, and the Isle of Man, from which, in view of past history, it would be quite safe to allow the importation of cattle for a free entry into our markets, instead of having to be slaughtered at the ports of landing. The health of United States cattle, Canadian legislation (quarantine regulations, etc.), are dealt with. The last pages contain the following:—

"Ireland, an important section of the Kingdom, separated from us by sea, embraces some 20,731,000 acres and has a population of 4,379,000, besides a total of about 4,932,625 head of cattle.

"Canada, an important section of the Empire, also separated from us by sea, embraces some 2,386,985,000 acres and has a population of 7,206,600, besides a total of about 6½ million head of cattle.

"In Ireland during the year 1912 sixty-eight outbreaks of foot-and-mouth disease occurred, 382 animals being attacked, and in the year 1914 seventy-six outbreaks occurred, 957 animals being attacked.

"In Canada that disease does not exist.

"Therefore, if Ireland, notwithstanding the fact that she had a total of 144 outbreaks in the years 1912 and 1914, were permitted during those two years to send a total of 3,069,038 cattle, sheep, and swine into this country through about twenty different ports, some to be slaughtered on landing but the majority to be exposed at our markets and sale-yards, surely Canada, which is absolutely free from the disease, ought not to be continuously debarred from enjoying the privileges to which she is justly entitled. . . ."

The health of animals in Canada is referred to as follows:—

"1. Rinderpest (cattle plague) has never been seen in Canada.

"2. Bovine contagious pleuro-pneumonia has never been seen in Canada outside of the quarantine station at Quebec. . . . In the years 1893, 1894, and 1895, however, four, six, and two Canadian cattle, respectively, were condemned at our ports as being affected, but the Canadian authorities hold that it was never shown to their satisfaction that these animals were suffering from contagious pleuro-pneumonia."

(Here follows an explanation of the probability of the disease known as "cornstalk disease" having been mistaken at our ports for contagious pleuro-pneumonia.)

"3. Foot-and-mouth disease.—This disease is always more or less rampant on the Continent of Europe, and has caused considerable trouble in England and Ireland during recent years. One might say that it is, of all animal diseases, the most highly contagious or infectious. It is reported to have existed in the Province of Ontario in the year 1870, and to have been stamped out without occasioning any great loss. Since then that disease has not been found anywhere in Canada. . . .

"Finally, notwithstanding the fact that during the past thirty years no fewer than 2,796,556 cattle, 1,367,712 sheep, and 1723 swine have been imported into this country from Canada, yet, with the exception of the twelve cattle alleged to be affected with bovine contagious pleuro-pneumonia twenty years ago, in no single instance has any one of these 4,165,991 animals been found to be affected with either rinderpest, bovine contagious pleuro-pneumonia, or foot-and-mouth disease."

(AUTHOR.)

HISTORICAL.

LEGENDS AND LORE OF THE GENESIS OF THE HEALING ART. R. CRAWFORD. *Lancet.* Vol. CXCI., No. 1870. 30th December 1916. Pp. 1086-1095.

The writer discourses on the legends, lore, and suppositions which have accumulated about the history of medicine and the origin of medical and surgical methods. Not least interesting are the sections devoted to the evidences of healing practices among animals and the belief in the animal origin of medical knowledge. The reader is reminded that Livingstone left it on record that some of the anthropoid apes staunch bleeding by pressure with the hand or by stuffing the wound with leaves, turf, or grass. It has also been recorded that a female monkey tore leaves from trees, as she fled with her wounded baby in her arms, and stuffed them into the bullet wound to stop the bleeding.

It must have been a matter of ancient knowledge to primitive man that his dog's sores healed more quickly than his own; and it can hardly be surprising that this was held to be due to licking. That this method of healing wounds should have been employed in the temples of Asclepius is, therefore, readily understood. In quite recent years licking of sores by the tongue of a dog was held in repute in Scotland and France. There is no evidence that licked wounds of dogs heal more readily than those which cannot be reached by licking; and the contrast with the slower healing in man would appear to be due to the difference in immunity to sepsis between man and the dog, for the dog is highly refractory to even subcutaneous injections of pyogenic organisms.

Ælian says that the Egyptians gained their knowledge of purgatives and emetics from the ancient tradition that dogs, when ill, eat grass and standing corn to relieve the stomach by vomiting and purgation. Aristotle says that wolves do the same. Ælian adds that dogs in this way relieve themselves of worms and of the excess of bile which causes rabies. The grasses which dogs eat have been identified as *Triticum caninum* (dog-wheat), *Agrostis canina* (brown bent-grass), and *Cynosurus cristatus* (dog-grass). The author does not agree that dogs eat grass to produce vomiting and purgation. They are more prone to eat it on reaching green fields after a spell of town life; and it does not produce actual vomiting. It is usually hawked back, churned up with saliva, and has probably not passed far down the gullet. The author strongly suspects that there is some subtle aroma of the grass that tickles the dog's palate; and seeing how much misery a dog suffers in the prospect and act of vomiting, he is reluctant to believe that it entertains any therapeutic purpose.

HYGIENE AND PREVENTIVE MEDICINE.

THE MILK SUPPLY OF NEW YORK STATE AND CITY (Report of the Committee on Clean Milk, New York State Veterinary Medical Society). C. WAY, C. I. CORBIN, and E. W. FITCH. *Cornell Veterinarian*. Vol. VII., No. 1. January 1917. Pp. 5-12.

There are three grades of milk sold in New York State, designated A, B, and C. The State Code provides for a raw and a pasteurised supply of each grade. The New York City Code provides for three grades also, but only one of these may be raw, namely, Grade A. All other milks must be pasteurised. The following are the requirements for each grade:—

Grade A Raw Milk in both Codes.—An annual tuberculin test of the herd. A bacterial count not to exceed 60,000 bacteria per c.c. at any time prior to delivery. (In certified milk a maximum of 10,000 per c.c. is specified.) A minimum dairy score of 75, of which at least 25 shall be equipment and 50 methods. The milk must be delivered within thirty-six hours from the time of production. Bottled at the dairy or farm. Labels and caps printed in black.

Grade A Pasteurised.—Physical examination of all cows in the herd. Maximum bacterial count of 30,000 per c.c. after pasteurisation and 200,000 per c.c. before pasteurisation. Dairy score of 68—equipment 25, and 43 for methods. Delivered within thirty-six hours after pasteurisation. Caps, tags, and labels printed in black.

Grade B Pasteurised.—Physical examination of cows. 100,000 bacteria per c.c. after pasteurisation, 1,500,000 before pasteurisation. (The State Code specifies the maximum of 300,000 bacteria per c.c. before pasteurisation.) Dairy score, 55—20 for equipment, 35 for methods. Delivery within thirty-six hours after pasteurisation. Caps, tags, labels, etc., printed in green. (Grade B raw milk in the State Code specifies the same requirements, with the exception that the maximum bacterial count shall be 200,000 per c.c. prior to delivery.)

Grade C Pasteurised.—The physical examination of cows. Bacterial count of 300,000 per c.c. after pasteurisation, and 1,500,000 per c.c. before pasteurisation. Dairy score of 40. Delivery within forty-eight hours after pasteurisation. (Delivery in cans only.) Tags, labels, etc., printed in red. (The State Code specifies the same requirements, with the exception that no maximum bacterial count is stated.)

The greater part of the milk sold in New York City and State is of Grade B. In New York City it is Grade B pasteurised, and in New York State (outside New York City) the sales of Grade B raw and Grade B pasteurised in the larger cities are probably about equal.

INFECTIOUS DISEASES.

SOME FACTS ABOUT ABORTION DISEASE. E. C. SCHROEDER and W. E. COTTON. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 3. December 1916. Pp. 321-330.

PRACTICALLY SIGNIFICANT FACTS ABOUT ABORTION DISEASE. E. C. SCHROEDER and W. E. COTTON. *Amer. Journ. Vet. Med.* Vol. XII., No. 2. February 1917. Pp. 73-78.

One of the most important facts about this disease is that cows often remain carriers of the abortion bacillus long after they have ceased to abort, and that cows which have never aborted and regularly and normally produce seemingly healthy calves may be chronic carriers and disseminators of the bacillus. So far as the authors have been able to ascertain, the abortion bacillus is an obligatory parasite. They have no data to support the belief that it can live and multiply as a saprophyte.

The favourite habitat of the bacillus is the mammary gland, and this is apparently its only habitat in the bodies of non-pregnant cows. The work of the authors regarding this fact includes hundreds of carefully made tests with milk from numerous cows. Some of the cows had aborted and others had not; the milk of some was infected with the bacillus continuously, and that of others intermittently; that of some of the cows remained infected year after year and that of others for shorter periods of time. In the case of a cow that remained under observation seven years, periodic tests proved the milk to be infected continuously.

In one herd of more than 150 cows, among which abortion had occurred with varying frequency for several years, a single test of the milk of each revealed that 14 per cent. were expelling the abortion bacillus from the udder. These facts point to the possibility of spread of the disease by the infected hands of the milker.

In numerous tests the bacillus was never found in the milk of a cow unless both her milk and her blood serum possessed agglutinating properties for suspensions of the bacillus. This does not mean, however, that the milk of all cows which react to the agglutination test is infected; milk from reacting cows has been repeatedly tested without the detection of bacilli.

When a cow has aborted, the foetus, the placenta, the uterus, and the discharges from the vagina are infected with organisms, and it is important to know that the abortion bacillus remains alive and active in dead animal tissues long enough to make negligence and carelessness regarding the proper disposal of abortion products eminently dangerous.

When bacilli are injected into the uterus of non-pregnant cows

they disappear in the course of a few days. The discharge from the uterus of a cow which has aborted may contain the bacilli for twenty, thirty, or even forty or fifty days, but they eventually disappear.

The authors have records of two cows, one of which harboured the abortion bacillus in her uterus for forty-six, in the other for fifty-one days after abortion. But the tests, taken as a whole, seem to show that these are rare cases.

When abortion bacilli are injected into the mammary gland through the teat, using a method which avoids trauma, bacilli are established in the gland, and the cow, according to all available tests, becomes an infected animal.

The authors have a number of records which go to show that cows, irrespective of whether they have at some time in the past aborted or not, may give birth to seemingly normal calves in a seemingly normal manner associated with the occurrence of abortion bacilli in the uterus and placenta.

A number of calves produced by cows with infected udders were killed immediately after they were born, and their bodies tested for the presence of the abortion bacillus by guinea-pig inoculation methods. The calves were not permitted to come into contact with their mothers or other sources of infection. It was found that such calves may harbour abortion bacilli in the stomach and gastro-hepatic lymph glands, but invariably, when the calves were infected the placenta and uterus of the dam were also infected.

From this it follows that seemingly normal parturition may disseminate infection. There should, therefore, be no carelessness in the disposal of the placenta in herds in which abortion has appeared, and the segregation of cows which are about to calve, or have just calved, is strongly recommended.

Subcutaneous injection of moderate quantities of suspension of the abortion bacillus into non-pregnant cows merely leads later to a positive reaction to abortion tests. The power to react endures for varying periods of time and seems to be passive rather than active. Whether the subcutaneous injection of pregnant cows with moderate quantities of bacilli causes them to abort, the authors have not been able to determine.

If abortion organisms are injected into the veins of non-pregnant cows they disappear from the circulation in about two hours, but are to be found in the udders.

An account is given of two bulls which reacted when the blood serum was tested with suspensions of abortion bacilli. In one of them the reaction was positive in a dilution of 1 to 200, and in the other in a dilution of 1 to 100. The bull with the higher reaction was killed

and examined post-mortem. The only lesion discovered was an abscess involving the epididymis of one testicle; the abscess was definitely proved to be infected with the abortion bacillus.

The other bull was permitted to serve a cow which, according to her history and all tests, was free from the disease. Immediately after service the semen was recovered from the uterus and injected into a number of guinea-pigs which subsequently showed abortion bacillus lesions. Nevertheless, the authors are not persuaded that the bull is a certain disseminator of the disease; but at the same time, in view of the uncertainty of present knowledge, they would regard it as foolhardy to take liberties with reacting bulls, or bulls from infected herds, or promiscuously used bulls. (On the subject of the bull as a disseminator—Hadley and Lothe, *Journ. Amer. Vet. Med. Assoc.*, 1916, vol. I. p. 143. See this *Review*, 1917, Vol. I. p. 13.)

THE PRESENT STATUS OF THE ABORTION QUESTION. A. EICHHORN and G. M. POTTER. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 3. December 1916. Pp. 295-307.

After a general discussion of the present position of our knowledge of the disease the writers conclude that contagious abortion in America is spreading rapidly. The difficulties of investigation have prevented the solution of many problems which must be settled before further progress can be made. There seems to be a definite tendency towards herd immunity where susceptible animals are not introduced. The serological tests are the most reliable diagnostic agencies for routine work, but they are not infallible, and in the present state of our knowledge cannot be used in sanitary police control. The part played by the bull and the time at which infection takes place have not been satisfactorily determined. The infection of calves shortly after birth, and the persistence of the infection until parturition, seems to be a negligible factor. The use of biological products is still in the experimental stage; therefore methods of proven utility should not be neglected. Claims made for so-called curative and preventive preparations are largely unfounded and extravagant. Sanitary measures and the control of breeding are still the most reliable means of overcoming the disease.

VACCINATION AGAINST INFECTIOUS ARTHRITIS OF FOALS DUE TO *B. ABORTUS EQUI*. J. F. HARDENBERGH. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 3. December 1916. Pp. 331-349. 3 Tables. 6 Figures.

An outbreak of abortion occurred in a large stud of thoroughbred mares. Several of the mares had dropped premature dead foals.

Vaccination experiments were conducted with a vaccine prepared from agar cultures of *B. abortus equi*, grown in an incubator for forty-eight hours at 37·5° C. The cultures were washed off in normal saline solution and killed in the water-bath for one hour at 60° C., and then shaken rapidly for thirty minutes in a bottle with glass beads. To the killed vaccine was added 0·5 c.c. carbolic acid as a preservative. Sterility tests of the vaccine showed no growth after three days. The approximate number of organisms per c.c. was estimated at about 8,000,000.

The fact that all the foals, either infected or later developing affections of the joints, gave a marked local reaction to the bacterin may indicate such a preparation to be of diagnostic value. Vaccination of exposed foals with a specific bacterin appears to confer some immunity to the disease, and may also have some curative properties, as seven out of ten foals, either thoroughly exposed to infection or badly infected, failed to develop or completely recovered from a severe attack of infectious arthritis. Owing to the fact that the authors were unable to try the vaccine on a large number of animals, they hesitate to base conclusions too strongly on the results obtained. The results should be confirmed.

It appears to the authors that two or three injections of 50,000,000 to 100,000,000 organisms, followed if necessary by more, would be much better than numerous injections of small amounts.

FOOT-AND-MOUTH DISEASE (La virulenza del sangue degli animali malatti di afta epizootica). G. Cosco and A. AGUZZI. *La Clinica Vet.* Vol. XXIX., No. 7. 15th April 1916. (Richerche ed esperienze per lo studio della immunita all' afta.) C. TERNI. *Ibid.* No. 9. 15th May 1916. (Spigolature nella peste avaria e nell' afta.) S. BELFANTI and A. ASCOLI. *Ibid.* No. 12. 15th October 1916. Pp. 577-597.

Cosco and Aguzzi contribute a preliminary note on the results of a series of experiments they have undertaken on the virulence of the blood of animals affected with foot-and-mouth disease. In the meantime they communicate the following conclusions at which they have arrived. Further detail is promised later. The blood of affected animals is virulent at all times during the febrile stage. The red blood-cells and the serum are equally virulent. Defibrinated blood kept at a freezing temperature retains its virulence for more than a month, the red cells being virulent longer than the serum. The subcutaneous injection of 1 c.c. of washed cells or serum will produce the disease in bovines. The virulence is not increased by inoculation through a series of bovines. Inoculation with blood-cells by rubbing

and abrasion of the buccal mucosa did not produce infection. The red corpuscles, which include the virus in a pure state, represent a means of homogeneous culture that can be used in the preparation of vaccines.

Terni reports that the passage of blood through a series of sensitive animals presents a method for the indefinite preservation of the virus. Lingual inoculation with blood taken during the febrile stage of foot-and-mouth disease (when the temperature is above 40° C.) is the best method of preservation and control. Virus thus acquires great activity and a remarkable power of diffusion. The incubation period in adults is not more than twenty-four to thirty-six hours.

Blood heated or frozen to the point of disappearance of virulence may be used as a vaccine. Its inoculation, followed by the injection of non-modified virus, produces marked immunity.

The serum of animals which have passed the febrile stage has preventive and curative properties. It is possible that it may be used for prophylaxis.

Terni distinguishes a local tissue immunity and an immunity of the blood, and holds that the clinical forms of foot-and-mouth disease depend upon variations in these two immunities. He considers that the virus is chiefly excreted in the urine, in which it retains its virulence for a long time. The virus is also excreted in the milk and saliva, but its attenuation is rapid in the latter.

Experiments by Belfanti and Ascoli have shown that the contents of foot-and-mouth vesicles kept for five days in the incubator does not produce the disease in young pigs, but confers a certain degree of immunity. The defibrinated and washed blood from a diseased animal produces a febrile reaction without eruptions, and confers sufficient immunity to resist the virus from the ox or pig. The blood from a fowl which has died of avian plague produces an elevation of temperature, but confers no immunity against the virus of foot-and-mouth disease.

GENERALISED VACCINIA (De la vaccine généralisée expérimentale. Conditions de sa production). L. CAMUS. *Bull. Acad. Méd.*, Vol. LXXVI., No. 43. 31st October 1916. Pp. 342-344. (Reproduction de la vaccine généralisée chez le chien.) *Ibid.* No. 45. 14th November 1916. Pp. 376-377. (La vaccine généralisée expérimentale chez la génisse et chez le singe.) *Ibid.* No. 47. 28th November 1916. Pp. 433-435. (À propos de la vaccine généralisée chez le chien.) *C. R. Soc. Biol.* Vol. LXXIX, No. 18. 18th November 1916. Pp. 1008-1009.

Generalised vaccinia, also known as vaccinal eruptive fever, is an affection characterised by the appearance of pustules in regions having

no external contact with the vaccinal virus. The virus is carried by the blood.

In 1866 the late Professor Chauveau produced the condition in the horse by injections of vaccine into the lymphatic system (*Bull. Acad. Méd.*, 1866, vol. xxxi., p. 1134). Later, he produced the same effects by intravenous and subcutaneous injections, by insufflation of the powdered vaccine into the respiratory passages, and by ingestion. He was not successful in producing generalised vaccinia in bovines. Of thirty-four experiments all were failures.

Calmette and Guérin were unable to induce the condition in the rabbit. The present writer has succeeded in doing so, and holds that the only condition for success is the introduction of a sufficient quantity of vaccine into the circulation of a non-immunised animal. He concludes, therefore, that the production of experimental generalised vaccinia is not peculiar to equines, but that these animals have probably a greater aptitude for presenting the morbid manifestations.

The condition in the dog was produced by the injection of a strong dose of diluted homogeneous vaccine. The first eruptions were seen on the lower jaw, cheek, and limbs, on the seventh day after inoculation. On the following day many papules and papulo-pustules were found over all the body, but were absent on the mucous membranes, which up to tenth and fifteenth day remained free from eruptions. The skin pustules grew, and became covered with a prominent and, in some cases, an umbilicated crust. Many papules gave place to pustules.

The animal showed a temporary depression and a slight loss of appetite.

Inoculation of material from the papules into calves and a rabbit caused a typical eruption.

Camus has also produced generalised vaccinia in a male monkey, *Macacus rhesus*.
(J. P. R.)

EQUINE CONTAGIOUS ABORTION (Dell' aborto contagioso delle cavalle).

L. COMINOTTI. *La Clinica Vet.* Vol. XXXIX., No. 24. 30th December 1916. Pp. 705-716. 1 Table.

According to the author this disease has been most frequently observed in mares of the Belgian race.

Abortion is not preceded by either general or local phenomena, nor was there ever any condition observed—such as metritis, retention of the placenta, vaginitis, haemoglobinuria, phlebitis, mastitis—by which Guillery (*Arch. f. Tierheilkunde*, 1901, vol. xxix, p. 37) distinguished a malignant from a benign form.

As the result of his observations and investigations the writer is driven to the conclusion that the problem of the etiology of equine

abortion is not as yet definitely resolved, and that further research is needed to establish the significance of the bacillus of the paratyphoid-enteritis B sub-group which has been most frequently isolated from the aborted foetus.

A CASE OF COMPLICATED GLANDERS. BRINGARD. *Rec. Méd. Vét.* Vol. XCII, No. 21. 15th November 1916. Pp. 618-622.

A number of in-contact horses were subjected to the intradermal palpebral mallein test. One of them reacted in so far as there was some swelling of the lower eyelid and slight purulent lachrymation. The case, however, was considered doubtful, as a copious catarrhal discharge and abscesses in the maxillary space seemed to point to strangles. To verify the reaction, the right eye was injected; but the result was so inconclusive that the subcutaneous test was applied. This, however, gave no more definite result. While waiting for the establishment of a condition suitable for re-inoculation, a superficial sore appeared in the region of the femoro-tibial joint, and this was followed by a cording and ulceration of the lymphatics inside the thigh. Along the course of the carotid, swellings appeared and in these pus collected. The pus was found to contain the organism of strangles but not that of glanders. Another sample of pus, however, revealed the presence of the *Bacillus mallei*.

An ulcer appearing on the nasal septum, the horse was destroyed. Post-mortem examination demonstrated that strangles and glanders co-existed.

Bringard holds that, though diagnosis was difficult, the following conditions were of assistance. Though not marked, there was a reaction with the palpebral test, and the subcutaneous test produced a slight elevation of temperature. Doubtless the rise of temperature would have been more noticeable had it not been that the initial temperature was high. Excessive tenderness of the swelling at the point of injection was also a suspicious circumstance. The permanent febrile condition, combined with the symptoms produced by malleination, formed a further index.

(T. G.)

(R. E. B.)

VARIOLA AND VACCINIA IN CALVES (La variolisation des génisses immunisées contre la vaccine). R. WURTZ and E. HUON. *C. R. Acad. Sci.* Vol. CLXIII, No. 13. 25th September 1916. Pp. 311-312. (Inoculabilité de la variole à la génisse vaccinée, mais non complètement immunisée). A. BÉCLÈRE. *Ibid.* No. 22. 27th November 1916. Pp. 676-678.

It is well known that vaccination of calves with the Jenner vaccine

confers a lasting immunity after a relatively short time. Kelch, Camus, and Tanon have shown that immunity is always acquired on the eighth day.

Wurtz and Huon inoculated calves with variola eight days after Jenner vaccination, and variola was produced. It appears that the Jenner vaccine, while it immunises against vaccinia, sensitises for variola, but for a short time only.

These experiments point to the conclusion that variola and vaccinia are due to two quite different organisms.

Béclère, however, concludes that the viruses of vaccinia and variola are certainly not of the same activity, but there is nothing to permit the affirmation that there is a difference of nature or of kind between the two viruses.

LESIONS OF THE NASAL MUCOUS MEMBRANE IN EPIZOOTIC LYMPHANGITIS (Au sujet des altérations de la pituitaire dans la lymphangite épidémique). L. CAZALBOU and G. MOREL. *Rev. Path. Comp.* No. 128. November 1916. Pp. 11-18.

In this communication the authors draw attention to the prevalence of nasal lesions in epizootic lymphangitis which tend somewhat to confuse the disease with glanders. They state that in their Army Orders there is no mention of such lesions, and in quoting Nocard and Leclainche (*Les maladies microbiennes des animaux*, 1903), Priscola (*Rev. Gén. Méd. Vét.*, 1907), and Trouette (*Rev. Gén. Méd. Vét.*, 1912), point out that the descriptions of nasal lesions given by these writers are not exactly the same.

In the discussion which followed, several members expressed themselves as quite familiar with nasal lesions in epizootic lymphangitis: while a number with experience of the disease had never seen ulcers in the nasal cavities.

(A. M.T.)

TREATMENT OF EPIZOOTIC LYMPHANGITIS BY IODIDE OF POTASSIUM (Note sur le traitement de la lymphangite épidémique par l'iode de potassium). J. CARTIER. *Rec. Méd. Vét.* Vol. XCII., No. 21. 15th November 1916. Pp. 614-618.

Sharing the opinion that the causal agent of epizootic lymphangitis belongs to the class of blastomycetes, and having had occasion to treat a number of cases of the disease, Cartier was led to use iodide of potassium, the efficacy of which is well known as an agent against mycoses of man and animals.

Trypaz used iodide of potassium as an intravenous injection. This method, however, appears to have disadvantages. It necessitates

repeated injections, and introduces into the blood a chemical agent of great diffusibility. Cartier, therefore, gave the drug by the mouth, and administered doses of 12, 15, 18, and even 20 grainmes daily without being compelled to interrupt the treatment because of toxic accidents. It was found desirable to divide the daily dose and administer it on at least two occasions—morning and evening. It was also found desirable to interrupt the course of treatment by periods of several days (seven to ten) during which the drug was not given.

External treatment consisted of punctures and drainage of pus, with washing of the sores with the following solution :—

Iodine	1 grammie.
Iodide of potassium	10 grammes.
Water	250 c.c.

In order to destroy the parasites *in situ* and prevent their dissemination, the ulcerations were then powdered with

Iodide of mercury	1 grammie.
Talc	60 grammes.

The treatment was efficacious in seven cases, particulars of which are given.

MEDICINE.

STRICTURE OF THE PYLORUS IN CATTLE. P. WILSON. *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 6-11.

This is an uncommon disease affecting cattle which does not appear to have been much if at all discussed in veterinary literature.

At first the cow shows some indications of being slightly indisposed, and the owner thinks the animal is constipated, because he notices that the faeces are reduced in total amount, although their consistence and appearance is normal. The pulse is about 72 per minute; the temperature and respirations are normal. The left side of the body over the rumen appears to be full, but the abdomen is, as a whole, not so much distended as one would expect, considering the small amount of faeces said to have been passed. Normal peristalsis exists in the rumen, but not in the omasum.

The diagnosis indicated is atonic indigestion. Treatment produces a short amelioration of the condition, but a relapse follows in a few days. Amelioration and relapse follow each other in regular sequence every few days, after a dose of purgative medicine followed by laxative

treatment. During this time the pulse, respirations, and temperature, and the shape of the abdomen, alter little, if any, from their state at the beginning of the case. Gradually, however, it becomes evident that each dose of medicine brings away a smaller quantity of faeces and the period of improvement is of shorter duration. Eventually a hollowness of the left flank shows that the rumen is emptying itself; and about the same time it becomes evident that the right lower part of the abdomen has become enlarged and depressed; moreover, it is very hard to the touch. The change in shape is very marked.

At this period the only result from a laxative is the passing of some liquid, in which there may be floating a few particles of straw. From this time on the patient gradually passes into a more unsatisfactory state, until symptoms of acute inflammation arise and a fatal termination ensues.

The most striking features of a post-mortem are:—The enormous size of the third and fourth stomachs and the shrunken appearance of the rumen, also the empty condition of the bowels. The pylorus and a short length of the duodenum show thickening and hardening of their tissues, and the lumen of the pylorus is greatly reduced.

The treatment employed has not been successful in any case. A suggestion is made that potassium iodide might be tried in some future case. But slaughter before loss of condition becomes too evident would appear to be the most economical course to pursue.

The pathology of the disease is discussed.

(AUTHOR.).

SAND COLIC (Quelques considérations pratiques sur les "coliques de sable"). P. MICHEL. *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 18-27. 2 Charts.

The author has had considerable experience of the condition in army horses located among the dunes on the coast of the North Sea. Cases are observed most generally in the evening after watering or feeding. A short period of uneasiness is followed by marked agitation. The horse lies down, rolls, assumes abnormal postures, tosses about violently, gets up, scrapes the ground, makes more or less ineffectual efforts to urinate, passes small quantities of dry faeces with variable quantities of sand, or has noisy evacuations of very soft faeces mixed with malodorous flatus. There are periods of calm during which the animal looks round at the flanks, lies down carefully and remains inert, with short and rapid respirations, dilated nostrils and agonised expression, and a more or less injected conjunctiva.

Disturbance may lead to a fresh paroxysm, but otherwise the period of tranquillity may last for several hours with short fits of uneasiness.

The case generally ends favourably, at least to all appearance. In some cases, happily rare, death occurs suddenly, and post-mortem examination reveals, most frequently, rupture of the stomach or colon, a hernia, or similar condition.

In most instances the animal appears to be cured, but an attack of less gravity occurs some eight or ten days later. Appropriate treatment, however, renders this of little danger. The author has encountered many cases of repeated colic in which no opportunity has offered for making a post-mortem examination.

Those post-mortem examinations which have been made have revealed an abundance of sand in the pouches of the cæcum and colon. Forty-five kilogrammes have been found in a horse the body weight of which was 550 kilogrammes.

Statistics furnished show the increase in the percentage of cases of colic when horses are removed to a sandy district. If proper precautions are taken the number of cases diminishes rapidly. Michel thinks that the drinking water is mainly responsible for the ingestion of the sand. But sand invades everything. Drinking places, mangers, and food are constantly peppered with it.

It is obvious that preventive treatment points to the need for as pure a water supply as possible. The watering-place should be large and deep, and filled some time before it is used in order to permit the maximum clarification of the water. The trough should be provided with a grating which will prevent the drinker disturbing the deposit at the bottom. Horses should not be allowed to drink at ditches or ponds where they may enter the water and so disturb it. The horse should also be provided with a nose-bag during grooming and when standing in the open air. Stables, food-stores, and drinking-troughs should be protected from the sand-carrying winds.

Seeing that the disease is seldom fatal, curative treatment is simple. Tincture of opium is used to allay the paroxysms. When these are cured, the sand is evacuated by repeated doses of pilocarpin. Laxative food is given. Complications are dealt with as they arise. Purgatives are useless.

[On the same subject, see the article by Friez abstracted in this *Review*, 1917, Vol. I. p. 28.]

WHAT IS A DISEASE? C. MERCIER. *Science Progress*. Vol. XL, No. 42. October 1916. Pp. 228-235. No. 43. January 1917, Pp. 410-422.

There is as much difficulty in giving a definition of "a disease" as there is in defining the fundamental concepts of any other calling. "It

is remarkable that the want of valid definitions of fundamentals is for a long time but little felt, and does not seriously interfere either with the practice or with the advance of knowledge. . . . In every calling, however, a time must at length come when a definition of its fundamental concepts is needed. . . . Such a time is now arrived in the history of medicine."

The various parts of the body have certain duties or actions which are called functions, and according as the duty is well or ill performed, the function is normal, or defective, or disordered. "The duty towards the rest of the body, which may be termed the extrinsic function, varies extremely with the nature of the part; but the duty towards itself, which may be termed the intrinsic function, is the same in every part, and consists in making good the waste consequent on the performance of the extrinsic function, in repairing any structural damage that may be inflicted upon it, and in repelling the attacks of injurious agents, whether chemical, microbic, or cellular."

In every case where function is disordered there is some sort of manifestation called a *symptom*. "This, then, is the definition of a symptom. It is a sign or manifestation of disorder of the function, intrinsic or extrinsic, of some part of the body."

The term disease is wide and comprehensive, covering not only all disorders of function, and all symptoms, but also all results of disorder of function, whether intrinsic or extrinsic. Thus, indigestion, a disorder of extrinsic function, is disease; atrophy, a disorder of intrinsic function, is disease; pain, which is a manifestation of disorder of either intrinsic or extrinsic function, is disease.

Difficulty arises when one speaks, not of disease, but of *a* disease. Albuminuria is disease, but it is not a disease. Not everything which is disease is a disease.

Some disorders which were formerly called diseases are now known as symptoms, the change being due to our mode of contemplating them. That which was a species of birds, or insects, or plants, is now a mere variety; that which was once a variety is now become a species. The birds, or insects, or plants are not changed; even our knowledge of them is not changed; what alone is changed is our way of contemplating or estimating them.

Though structural damage to an organ, together with the consequences and symptoms it produces, may constitute a disease, it does not necessarily do so. In the course of acute rheumatism a valve of the heart may suffer structural damage with its own consequences and symptoms, all of which may be included in the term "heart disease." But this group of structural damage, consequences, and symptoms, is only part of "the disease," which is acute rheumatism. Again, a vegetation

may become detached from the valve of the heart and produce "embolism of the brain" with its consequences and symptoms. But the disease is not embolism of the brain; it is still acute rheumatism, of which the damaged heart and the embolism are consequences and parts. But if the acute rheumatism subsides and disappears, then the damaged valve, plus its symptoms and consequences, becomes the disease from which the patient suffers.

Although in many cases the structural basis of the symptoms does enter into the concept of the disease, in others a structural basis forms no part of the concept. Blindness is considered a disease though no structural basis may be known.

The following definitions are advanced by Dr. Mercier:—

1. *Function*.—The duty, office, work, or part that is performed by an organ or tissue.
2. *Extrinsic Function*.—The work done by an organ or tissue for the other parts of the body, or for the body as a whole: the part the organ or tissue plays in the bodily economy.
3. *Intrinsic Function*.—The maintenance and repair by an organ or tissue of its own structural integrity.
4. *Disease*.—Disorder of function. The wrong or defective execution of function, either extrinsic or intrinsic. Also signs and results of such defect or disorder.
5. *Symptom*.—A perceptible sign or manifestation of disorder and defect of function.
6. *A Disease*.—A mental construct or concept, consisting of a symptom or group of symptoms, correlated with or by a single intracorporeal cause, known or postulated.
7. *A Sub-Disease or Symptomatic Disease*.—A symptom or group of symptoms correlated with or by a structural change which is part of an existing disease.
8. *An Infection*.—The invasion of the body by a living foreign agent which has the power of multiplication and distribution within the body, and may concentrate its attack on this or that part so as to give rise to a sub-disease of which the damage to that part is the correlating agent. (For the purpose in hand malignant disease is a foreign agent.)
9. *Organic Disease*.—A disease whose correlating basis is believed to be material—that is to say, a disorder of the structure or function of some part of the material body.
10. *Functional Disease*.—A disease which is believed to have no correlating basis except in the imagination of the patient.

The terms *syndrome*, *symptom-complex*, etc., have not been examined in the present communication of the writer, who holds them as being "made for show and not for use."

PSEUDO-EPIZOOTIC ENCEPHALO-MYELITIS OF THE HORSE (Encéphalo-myélite pseudo-épidémique du cheval). G. URBAIN. *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 557-561.

In Paraná (Brazil) a very fatal disease, known as "Peste de Cegar," affects horses. The disease passes rapidly through the following phases:—(1) Blindness; (2) circular movements leading to unilateral paralysis; (3) immobility; (4) excitability, depression, coma, and death.

On post-mortem examination the stomach is found to be distended and filled with fermenting undigested maize. The gastric mucous membrane is greatly inflamed. There is congestion of the frontal part of the cerebral hemisphere, with haemorrhages into the corpora quadrigemina, corpora striata, and medulla oblongata. The lateral ventricles are distended with fluid and the adjacent nerve cells are in a state of degeneration. The spinal cord is similarly affected.

Urbain sets aside the causes which have been suggested by previous writers on the disease, and concludes that the causal agent is an *Aspergillus* found in the maize in the stomach of animals which have succumbed to the disease. The disease does not occur if the maize is sterilised before being used as food for horses.

AZOTURIA. M. R. STEFFEN. *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. P. 1.

The author calls attention to the many forms of the disease, and particularly distinguishes between its manifestations in town horses as compared with those in horses in the country. The city horse develops a more severe, acute, and, usually, a more rapidly fatal form. Cases seen in the country are of a milder type, and do not run such a rapid hyper-acute course. In addition, the disease presents different clinical pictures under different circumstances, environment, locality, feeding customs, breeds, and individuals.

The author would describe azoturia as an acute disease of horses, characterised by great nervous excitement in its early stages when it occurs in a typical form, and terminating in complete prostration. Secondary clinical phenomena are a haemoglobinæmia, delirium, and prolonged decubitus.

He classifies the various forms of the disease as follows:—

- (1) Cases during the initial stage of which symptoms of digestive organs predominate.
- (2) Cases during the initial stage of which muscular phenomena predominate.
- (3) Cases during the initial stages of which nervous symptoms predominate.

The writer is not satisfied with the usually accepted causes of the disease, and re-advances his "mechanical theory," the enunciation of which appeared in the *American Journal of Veterinary Medicine*, October 1912, and upon which the treatment by "Azolysin"—the active principle of which is oxalic acid—is based.

TREATMENT OF "MAL DE CHIEN" (MYELITIS) (Traitement du "mal de chien" par le sérum névrosthénique). VELOPPE. *Rev. Gén. Méd. Vét.* Vol. XXV., No. 296. 15th August 1916. Pp. 360-365.

The term "mal de chien" is employed to indicate one of the signs of myelitis (a possible sequel to strangles) because the horse assumes the posture of a sitting dog. Myelitis is apparently very fatal, records of recovery being very scanty.

Veloppe recommends the intramuscular injection of strychnin in the form of cacodylate of strychnia 0·1 gramme, glycero-phosphate of soda 10 grammes, distilled water 10 grammes. This being a mixture and not a solution, the cacodylate of strychnia must be in the form of the finest powder to avoid obstruction of the needle of the syringe, as well as to minimise the danger of the introduction of foreign particles into the veins.

In order that the strychnin may not produce any untoward symptoms the author recommends that the injection should begin with 2 c.c. of the mixture (equal to 1 centigramme, of strychnin) and be gradually increased, so that at the tenth day a dose of 10 centigrammes of strychnin is administered. The larger daily doses are better divided between two injections.

After ten days of injection the treatment is suspended for ten days.

Five cases in which this treatment was adopted are described. Three of these made a perfect recovery, and the others were greatly improved.

TREATMENT OF ECZEMA IN THE DOG (Traitement de l'eczéma chez le chien). CHÉNIER. *Rev. Path. Comp.* No. 130. January 1917. Pp. 4-5.

The eczematous diathesis in dogs is very obscure and the treatment is empirical. At Alfort sulphur is used internally as well as externally. Good results have been obtained by the use of pyoctanin. Chénier reports cures in cases of moist eczema treated with a powder of German origin, called *Dymal*, which appears to be Venetian talc, a substance advised by Cadiot, but mixed with other substances.

Chénier admits that he has not resolved the problem, but suggests a hypothesis. It is generally admitted that a flesh diet should be withheld. Hæmatoma of the ear, canker of the ear and tail, are indications

of the diathesis. It may be asked, then, if the eczema is not due to too great richness of the blood ? Therefore, why not bleed ?

THE EFFECTS OF EXPOSURE TO COLD UPON EXPERIMENTAL INFECTION OF THE RESPIRATORY TRACT. J. A. MILLER and W. C. NOBLE. *Journ. Exp. Med.* Vol. XXIV., No. 3. September 1916. Pp. 223-232. 3 Tables.

Exposure to cold has long been considered an important factor in the incidence of many respiratory diseases. Even with our increasing knowledge of the predominating part of bacterial infection the belief is still general among clinicians that chilling of the body exerts a predisposing influence of considerable importance.

The authors of this paper have made studies of the influence of cold as well as of heat on experimental infection of the respiratory tract of rabbits. The *Bacillus boviseppticus*, which belongs to the haemorrhagic septicæmia group, was chosen because it produces in the rabbit conditions similar to pneumonia and influenza in man, and because of the relative difficulties which have attended previous experiments with acute respiratory infections, particularly those caused by the pneumococcus.

As the result of their investigations the authors have come to the conclusion that respiratory infection of rabbits with the *Bacillus boviseppticus* is favoured by chilling the animals after they have been accustomed to heat. The evidence, therefore, does not justify the elimination of exposure to cold as a possible though secondary factor in the incidence of acute respiratory disease.

From the limited data of two experiments it is suggested that any marked change of temperature predisposes rabbits to this infection, the severity of which varies with the amount of change, and that a change from low to high temperature has an even greater effect than that from high to low.

SPONTANEOUS DIABETES IN A DOG. E. B. KRUMBHAAR. *Journ. Exp. Med.* Vol. XXIV., No. 4. October 1916. Pp. 361-365. 1 Plate.

Spontaneous diabetes in the dog or any other lower animal is of interest and importance because of its rarity; and when associated with pancreatic lesions it forms a valuable link between experimental diabetes of dogs and the spontaneous diabetes of man. While some pathologists believe that it occurs frequently in overfed, pampered dogs, published records of diabetes in animals are few in number.

Fröhner¹ observed seven dogs in which persistent glycosuria and other clinical signs of diabetes were present, and quotes other cases

observed by Schindelka, Eichhorn, Miller and Fettick (three each), and Gutzeit and Lienaux, Thiernesse, Schmidt, Wolff, Haltenhoff, Schulz and Strubing (one each). Eber² reported a series of twelve animals, and Lanfranchi³ and Ferraro⁴ each one; but all these occurred before Opie had demonstrated the now well-known lesions of the islands of Langerhans. Reports of diabetes in other domestic animals are even more rare, though it has been found in the horse by Dieckerhoff,⁵ Preller,⁶ Kruger,⁷ Heiss,⁸ Rueff,⁸ and Perosino;⁹ in the cow by Girotti,¹⁰ Ingardi,¹⁰ and Darbas;⁹ and in the ape by Le Blanc.⁹ Preller's case in the horse is the only instance in which the essential pancreatic lesions have been investigated by modern methods of technique. As showing the rarity of diabetes in animals, Fröhner states that his first two cases were the only instances of the disease met with in 40,000 examinations (incidence of 0·005 per cent.).

The case of which Krumbhaar's paper is an account occurred in a nine-year old Airedale bitch which began to lose weight after an abortion. The loss of weight was progressive; there was continuous thirst and a ravenous appetite. It was noticed that flies collected about her urine, of which a single drop completely reduced 2 c.c. of Fehling's solution.

On a general diet 60 grammes of sugar was eliminated daily. When placed on 10 grammes of nitrogen (beef heart) daily, the sugar fell to 30 grammes. By fasting, the sugar was reduced to less than 10 grammes.

After three months cataracts developed in both eyes. Abscesses and ulcers appeared on the legs and trunk, and emaciation became pronounced. A rapidly growing, freely movable, painless tumour appeared on the right side of the neck and discharged watery and later bloody pus.

The animal was chloroformed six months after the first symptoms were noticed.

On post-mortem examination the pancreas was found to be large, rather soft, of normal colour and shape, with no signs of inflammation or haemorrhage. Nothing else was revealed by the examination except a tumour on the right side of the neck, arising apparently in the thymus, and a similar mass at the base of the heart.

Zymogen granules were numerous in the pancreatic acini. There were a few collections of small round cells with local increase of fibrous tissue. The islands of Langerhans were few in number, and every island showed degeneration of one or more kinds. The most obvious change in them was a typical hydropic degeneration of one or more cells. W. B. Martin of the Johns Hopkins Medical School supplied the following report:—

"The islets show complete degeneration of the *beta* cells, although remnants of these cells still are apparent in some of the islands as red

staining areas. The *alpha* cells are also undergoing degeneration, but this has not progressed so far as in the others. The outline of the *alpha* cells can be made out, their nuclei are intact, and in a number of cases the blue granulation is still quite distinct. Some of the islets are made up entirely of *alpha* cells undergoing degeneration."

Though some of the island cells had a hyaline appearance, the typical hyaline degeneration of Opie and Weichselbaum was not present. On the other hand, certain localised areas showed that in many cases whole islands had been replaced by fibrous tissue.

The tumour of the neck was a sarcoma of the thymus.

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To these must now be added Mettam, A. E., and Craig, J. T., *Journ. Comp. Path. and Therap.*, 1916, vol. xxix. p. i. (See this *Review*, 1917, Vol. I. p. 31.)

METHODS.

METHOD OF USING BI-EOSINATE (Sur le mode d'emploi du bi-éosinate).

L. TRIBONDEAU. *C. R. Soc. Biol.* Vol. LXXIX., No. 19. 2nd December 1916. Pp. 1022-1024.

Bi-eosinate enables one to obtain blood-films very favourable to cytological study and to the investigation of parasites. It does not precipitate, and keeps well. Two methods of using bi-eosinate can be employed.

The *ordinary method* (*Leishman* type) is simple, and suitable for routine work. The blood is spread on slides, preferably by the "scissors method," and dried in the air. The films are heated with bi-eosinate for three minutes. Distilled water is then added to the stain and the whole allowed to act for about twelve minutes. The films are finally washed and dried.

The *improved method* (*May-Grünwald Pappenheim* type) gives finer results with less chance of stain-precipitation. The technique is similar to the above, except that the stain admixed with water is allowed to act

for only two or three minutes. The films receive a second staining with weak bi-eosinate.

It is important to avoid the least trace of acid or alkali in these methods. Precipitated stain can be removed by rapid washing in 80 per cent. alcohol and then in distilled water. The colour is restored by treatment with weak bi-eosinate. The films are examined without cover-glasses.

(J. P. R.)

**PREPARATION OF BLOOD-FILMS BY THE "SCISSORS METHOD" (Étale-
ment du sang sur lames de verre porte objets par le "procédé
des ciseaux.")** L TRIBONDEAU. *C. R. Soc. Biol.* Vol. LXXIX.,
No. 18. 18th November 1916. Pp. 1011-1012.

The blade of the scissors is held obliquely with cutting edge to the left, while the thumb and forefinger of the right hand hold the slide horizontally by one extremity. The lower surface of the slide receives a drop of blood about the size of a lentil near the index finger, and is closely applied in its middle to the cutting edge of the scissors in the form of a cross. Movement of the slide to the left and subsequent sawing action of the blade cause respectively entry into and spread of the blood in the angle between slide and scissors. Finally the slide is drawn to the right over the blade till the free end of the former is reached.

Regular films without distortion or confluence of the red cells is claimed. Leucocytes are more or less grouped and can be easily located.

(J. P. R.)

PARASITOLOGY.

THE ZOOLOGICAL POSITION OF THE SARCOSPORIDIA. H. CRAWLEY.
Proc. Acad. Nat. Sci. Philadelphia. June 1916. Pp. 379-388.

The developmental history of sarcosporidia suggests a close relationship to the coccidia. If Doflein's classification of the protozoa is followed, sarcosporidia may be grouped as a sub-order of Coccidiomorpha (class Sporozoa, sub-class Telosporidia), and not as Neosporidia, as has hitherto been the custom.

The "spore" of sarcosporidia is taken to be homologous with the coccidiomorphan merozoite, the products of the sarcosporidian zygote being homologous with either the spores or sporozoites of coccidiomorpha.

The widespread occurrence of sarcosporidia in animals of purely herbivorous habits—as the sheep—may be accounted for by a second host carnivorous animal—which becomes infested by eating the flesh.

of the herbivora. Merozoites are released in the intestine and encysted forms are voided with the faeces.

EQUINE PIROPLASMOSIS IN SARDINIA (La piroplasmosi equina in Sardegna). P. BIMBI. *Il Moderno Zooiatro*. Vol. V., No. 9. 30th September 1916. Pp. 225-233.

Piroplasmosis occurs as an enzootic disease throughout the whole of Sardinia. Native Sardinian horses seem to be immune. At any rate, cases of piroplasmosis have only been observed in imported (Hungarian) horses. Quinine, given in repeated small doses, has produced good results. Judging from the clinical phenomena, Bimbi concludes that the disease is always a babesiosis, and believes that the organism is transmitted by *Margaropus annulatus*.

TRYPANOSOME INFECTION BY MILK (Trypanosomiase des chevaux du Maroc. Infestation d'un jeune chien par l'allaitement). H. VELU and R. EYRAUD. *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 567-568.

An experiment was devised to test the statement (Nattan-Larrier and Lanfranchi) that trypanosomes are excreted in the milk of infected females. A bitch was injected subcutaneously with 20 c.c. of the blood from a goat which harboured the trypanosome which affects horses in Morocco. This was done five days after the birth of three pups. The bitch showed febrile symptoms, and a few parasites were found in the peripheral blood fourteen days after infection. They then disappeared, to reappear about a month afterwards, and finally for about fifteen days before the death of the animal on the sixty-sixth day after injection.

Two of the puppies were separated from the mother a fortnight after birth. They remained healthy. The third puppy was allowed to remain with and suck the mother. At two months old this puppy was dull and its growth seemed stunted. At three months conjunctivitis, followed by keratitis, was developed. The puppy died at three and a half months. Before death, trypanosomes, which gradually increased in number, were found in the blood.

OSSEOUS CACHEXIA OF EQUINES. CYLICOSTOMIASIS (Cachexie osseuse des équidés. Cachexie vermineuse des équidés. Cylicostomose). C. CONREUR. *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 600-633.

A peculiar disease occurs among the horses of Brazil which is known as "Cara inchada" or "big head." The disease has also been known to

affect asses and mules, but cases are comparatively rare. Young horses between two and two and a half years old are most susceptible; the occurrence of the disease becoming less frequent as the animal gets older.

The symptoms are divisible into four stages—(1) Premonitory symptoms, when the young horse wastes rapidly, does not feed properly, and spends much of his time lying down. (2) A stage of lameness and medullary derangement or pseudo-rheumatism. Colic and intermittent diarrhoea occur in this stage, and periostitis affects the bones of the limbs. It frequently appears as though the horse had injured his back: he turns with difficulty. Certain nervous symptoms are manifested. The superficial lymph-glands and the thyroid are enlarged. (3) This is the stage of osteoporosis, fractures, and "big head." (4) Osteomalacia with extensive absorption of lime salts from the bones, which become swollen and deformed.

Various theories have been advanced to assign a cause to the disease, but the author does not agree with them. He considers that a nematode, *Cylicostomum tetracanthum*, which is always found in great abundance in the caecum and colon, is responsible.

So far as treatment goes, it is necessary to ensure the expulsion of the worms and improve the general condition of the animal. For the expulsion of the nematodes the following is administered three or four times at intervals of from two to four days:—

Thymol	6 grammes.
Santonin	50 centigrammes.
Cape aloes	6 grammes.
Soap in sufficient quantity	to make one ball.

THE "OPEN-AIR CURE" OF MANGE (La gale et la cure d'air). BERTON.
Rev. Gén. Méd. Vét. Vol. XXV., No. 299. November 1916.
 Pp. 531-539.

It was by accident that the possibility of the spontaneous cure of parasitic mange was suggested to Berton. In January 1915 a dozen horses arrived from the front in a pitiable state. Mange plaques extended over the chest, withers, back, sides and croup; and there was continuous itching. The dépôt being full, these animals, for want of better accommodation, were turned into a field to await an opportunity for special treatment. For a fortnight they received no attention beyond feeding; a rivulet running through the field supplying drinking water. At the end of this time it was obvious that there was considerable amelioration of the mange, and it was decided to leave the animals in

their present position without any treatment. Improvement continued day by day; the itching disappeared, and at the end of two months the twelve horses were perfectly cured, fat, lively, and full of vigour. In March they were returned to their various units at the front.

There was an objection to the assumption that here was a spontaneous cure of mange, for the animals had not been subjected to a sufficiently rigorous diagnostic test. It was therefore necessary to repeat the experiment. Another dozen horses, upon which the acarus had been discovered, were placed under the same conditions as the first.

At the beginning of the experiment the horses were in a miserable condition. Mange plaques covered large surfaces. Some of them, infested with sarcops, psorops, and symbiots, had depilation not only on the body, but also of the mane and tail and on the limbs. After two months ten animals were absolutely cured and discharged. The other two, very old and worn-out, remained.

The author contends that mange follows the law of parasitism and finds most favourable conditions for development in an enfeebled animal. Free life in the open air acts beneficially upon all the physiological functions, and consequently plays the part of curative hygiene.

Treatment of mange should consist of two parts—therapeutic and hygienic. The first part of the treatment consists of clipping, washing, cleansing, and dressing. The hygienic treatment follows, and consists in turning the horses into the open, where they remain at liberty, day and night, whatever the season and whatever the weather. The quality of the pasture will determine if hay and oats should be supplied or not.

PATHOLOGY AND BACTERIOLOGY.

HÆMOLYTIC STREPTOCOCCI FOUND IN MILK. D. J. DAVIS. *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 236-252. 4 Tables. 2 Figures.

Hæmolytic streptococci occur commonly in milk. These strains are more resistant to heat than human strains, and possess little or no virulence for rabbits. The milk strains are different from certain strains of hæmolytic streptococci found at times in diseased udders of cows. The latter resemble the strains of hæmolytic streptococci from human sources, and are virulent for rabbits.

The importance of certain types of hæmolytic streptococci in relation to epidemics of sore throat makes it necessary to study carefully all such organisms in milk. (D. C. M.)

DIFFERENT TYPES OF STREPTOCOCCI AND THEIR RELATION TO BOVINE MASTITIS. G. MATHERS. *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 222-235. 7 Tables.

Careful bacteriologic studies of many epidemics of acute tonsillitis have yielded convincing evidence that the infection may be milk-borne, and that the cause is a virulent haemolytic streptococcus. Little is known about the behaviour of various strains of streptococci in the environment furnished by infected udders. Do the differences between strains of streptococci of human origin and those of bovine origin represent changes due to environment? Mather's experiments have been designed to throw light on these points.

An important factor in streptococcus infections of the udder emphasised by these experiments is the length of time that the organisms may be found in the milk.

Different types of streptococci of human origin may cause mastitis if they gain entrance into the milk ducts. Virulent haemolytic streptococci may grow and multiply in the milk ducts of a cow without causing any visible changes in the udder. (D. C. M.)

THE ACTION OF CHLORIDE OF SODIUM ON *BACILLUS ANTHRACIS* AND ANTHRACOID BACILLI (Acción del cloruro sódico y del agua de mar sobre el *Bacillus anthracis*, infección carbuncosa, bacilo anthracoide y otras bacterias). C. LÓPEZ. *Revista Hig. y Sanidad Vet.* Vol. VI., No. I. April 1916. Pp. 1-12. (Experimentos sobre la resistencia del *Bacillus anthracis* á la acción de las soluciones de cloruro sódico.) J. E. BORDOLI. *Revista Hig. y Sanidad Vet.* Vol. VI., No. 10. January 1917. Pp. 747-751.

López concludes that solutions of chloride of sodium kill anthrax bacilli in less than twenty-four hours. This antiseptic action is manifest in 2 per cent. solutions and is very notable in solutions of 10 per cent. Subcutaneous injection of 10 c.c. of a 10 per cent. solution does not prevent infection of the guinea-pig. It has not been possible to immunise guinea-pigs by a single injection of organisms killed by the action of saline. It is very probable that the ingestion of large quantities of concentrated saline may stop the disease in an infected herd.

Ten per cent. solutions did not kill anthracoid bacilli. It may be possible in this way to differentiate between the anthracoid bacillus and the true *Bacillus anthracis*.

Bordoli does not agree with López, and says very emphatically that

a 10 per cent. solution of NaCl does not kill the anthrax bacillus. Even after more than a month of contact, inoculation with 1 c.c. of solution will cause the death of guinea-pigs in two days.

THE INFLUENCE OF OSMOTIC PRESSURE ON BACTERIA (Nouvelles expériences sur l'influence qu'exerce la pression osmotique sur les bactéries). J. BEAUVERIE. *C. R. Acad. Sci.* Vol. CLXIII, No. 24. 11th December 1916. Pp. 769-772.

Beauverie studied the effect of the gradual increase of sodium chloride in fluid cultures (beef-broth) on the growth of intestinal organisms, organisms of pus, of the skin, and those found free in nature. Organisms from the intestine (*Cholera vibrio*, *Eberth's bacillus*, *Bacillus coli communis*, and *Staphylococcus pyogenes aureus*) easily stood a strength of 50 in 1000 of NaCl. The micrococcus of Unna from the skin was remarkable in being able to support a concentration of 300 in 1000, and doubtless even more. The explanation here seems to be that the micrococcus of Unna normally lives where there is considerable concentration of salines. The whole results appear to show that organisms are adapted to their normal media; and Beauverie, from the point of view of bacteriological technique, insists upon the utility of taking this factor into account in the preparation of culture media.

It is suggested also that molecular concentration may render more easy the production of endotoxins by favouring their exosinosis into the culture media at the time of death of the microbes. It will be particularly important to pursue the study of the influence of osmotic pressure on the production of toxins, and it may be possible to find therein a means of attenuation. It is well known that certain viruses are attenuated by desiccation (rabies), that is to say, by dehydration; and this may also be effected by concentration.

A NON-GAS-PRODUCING STRAIN OF THE HOG-CHOLERA BACILLUS ISOLATED FROM AN OLD LABORATORY CULTURE. C. TENBROECK. *Journ. Exp. Med.* Vol. XXIV., No. 3. September 1916. Pp. 213-220. 5 Tables.

"In a stock culture of the hog-cholera bacillus, which was passed through a series of rabbits fourteen years ago, an organism was found that differs from the original culture in that it fails to form gas from the carbohydrates that are usually attacked by this organism, while acid formation persists. This new strain is agglutinated by an anti-hog-cholera bacillus serum and produces in rabbits and mice a disease similar to that caused by the typical cultures. The failure to form gas has persisted over a period of eighteen months, and all attempts to

cause the strain to revert to the original condition have failed. It resembles in many respects *Bacillus typhosus*, and it may be that some of the so-called typhoid cultures that are not agglutinated by anti-typhoid serum are non-gas-producing paratyphoids. Attempts to produce a similar change in a more recently isolated culture of the hog-cholera bacillus by means of animal passages and changes in the environment have been negative."

PRIMARY CARCINOMA OF THE PANCREAS IN A COW (Carcinoma canalicular del pancreas en la vaca). A. GALLEG. *Revista Hig. y Sanidad Vet.* Vol. VI., No. 7. October 1916. Pp. 503-522. 13 Figures.

The literature on primary carcinoma of the pancreas of domestic animals is very scanty. Cadeac states that such tumours have been observed in the dog. Gamgee (*The Veterinarian*, 1856) and Lienaux (*Ann. de Méd. Vét.*, 1895) have encountered carcinoma of the pancreas of the mare. Schneidemühl makes passing mention of adenomas, carcinomas, and melanomas in the dog. Friedberger and Fröhner refer briefly to melano-sarcoma in equines and adenomas and carcinomas in the dog as being more important anatomically than clinically. Hutyra and Marek add nothing to the records. Nocard (*Arch. d'Alfort*, 1877) has described with some detail a case of primary epithelial tumour of the head of the pancreas in the dog. In this case a microscopic examination of the tumour showed that it was a lobulated epithelioma.

Because of the paucity of records Gallego holds himself justified in describing with considerable detail a case of primary carcinoma of the pancreas in a cow which was killed in the abattoir at Santiago, the clinical history of which is entirely unknown. He gives a very full account of both the macroscopic and microscopic conditions.

The primary tumour of the pancreas had invaded the whole of that organ and had assumed the dimensions of a man's head. Adhesions to the liver, rumen, and intestine had been established. Metastatic nodules occurred in the diaphragmatic peritoneum, spleen, liver, and intestine, and in the lumbar, gastric, mesenteric, hepatic, pancreatic, and bronchial lymph glands. The peritoneal nodules were verrucose; those of the liver and spleen were fungoid and flattened like spots of wax. The surface of the intestine carried grey miliary granulations, and the lymph glands contained caseous-looking growths.

Microscopically there were notable differences between the primary pancreatic nodules and the metastatic nodules of the liver, spleen, peritoneum, intestine, and lymph glands. The former presented a typical picture of scirrhouss cancer with hyaline degeneration. The

cells formed linear colonies, tubular or rounded masses. The cells were spherical for the most part, but some were polyhedral and a few were cylindrical.

The metastatic nodules were clearly cylindrical adeno-carcinomas; the cells being columnar, and always arranged in a tubular manner.

HEPATIC CIRRHOSIS IN DISTOMATOSIS (*Las cirrosis hepáticas en la distomatosis*). A. GALLEG. *Revista Hig. y Sanidad Vet.* Vol. VI., No. 4. July 1916. Pp. 279-289. 6 Figures.

A large number of livers of sheep affected with distomatosis have been examined by Gallego, who finds that cirrhosis is a frequent lesion. The arrangement of the connective tissue permits the classification of the cirrhoses in three groups—annular, insular, and unicellular—after the manner adopted by Charcot for cirrhoses in the human subject.

The cirrhosis begins about the hepatic veins, the branches of the portal vein, the branches of the hepatic artery, or the radicles of the bile ducts—that is, it may be perihepatic, periportal, peri-arterial, or peribiliary. Frequently perihepatic and periportal cirrhoses coexists.

The liver cells appear to preserve their integrity, or undergo, at most, a slight fatty degeneration and biliary pigmentation. Nevertheless, some lobules may become necrotic with an intense small-celled infiltration.

The blood-vessels frequently exhibit inflammatory lesions which may cause vascular obstruction leading to ascites and oedema, so frequently encountered in distomatosis.

Eosinophile leucocytes infiltrate the portal spaces and the hepatic lobules.

TYPES OF LESION IN CHRONIC PASSIVE CONGESTION OF THE LIVER.

R. A. LAMBERT and B. R. ALLISON. *Bull. Johns Hopkins Hosp.* Vol. XXVII., No. 310. December 1916. Pp. 350-356. 3 Plates, 7 Figures.

It is generally recognised that the so-called "nutmeg-liver" of chronic passive congestion presents a varied microscopic picture. The writers have examined 112 cases, and have come to the conclusion that at least five types of lesion may be recognised—(1) Capillary dilatation with atrophy of the cells towards the centre of the lobule; (2) central degeneration with or without capillary dilatation; (3) marked fat accumulation in the cells about the hepatic veins with mid-zonal hyperæmia; (4) central necrosis with haemorrhage; (5) collapse fibrosis.

The type of lesion depends upon the degree of circulatory disturbance and its duration. Long-continued stasis of slight or moderate degree leads to capillary dilatation with progressive atrophy of the liver cells. Degenerative changes in the liver cells are due either to stasis of more marked degree, or to moderate congestion in conjunction with infection. Extreme stasis results in central necrosis with haemorrhage which passes into collapse fibrosis.

Necrosis of the liver cells in chronic passive congestion is the effect of stasis alone, leading to asphyxia of the cells farthest removed from their arterial supply. Infection plays a minor part in causing a definite necrosis, although it probably contributes to the production of degenerative changes in the cells. Very extensive necrosis is not infrequently seen in cases of extreme stasis unassociated with infection. Active regeneration is not regularly seen in chronic passive congestion. Chronic passive congestion never leads to the development of cirrhosis of the usual portal or nodular type. Collapse fibrosis is not a true cirrhosis, but a condensation of the reticular fibres where the liver cells have disappeared.

FATTY INFILTRATION OF THE CAT'S KIDNEY. V. H. MOTTRAM. *Journ. Physiol.* Vol. L, No. 6. September 1916. Pp. 380-390.

"The differentiation by morphological means between fatty infiltration and fatty degeneration is difficult, and the general consensus of opinion is that in fatty infiltration the globules of fat are large and that the rest of the cell is normal. The nuclei and nucleoli are clear and the chromatin normal and staining sharply. There is no raggedness of the cells, disintegration of cell substance, or of the cells one from another. But the dividing line between a fatty infiltration and a fatty degeneration under the microscope is a difficult task to determine. Indeed, Virchow states emphatically that an absolute differentiation is impossible. . . . Chemical criteria are ultimately the only reliable criteria, though, of course, morphological criteria are useful in confirmation of chemical results."

POULTRY DISEASES.

BOTULISM, A CAUSE OF LIMBER NECK IN CHICKENS. E. C. DICKSON. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 5. January 1917. Pp. 612-613.

During an investigation of several outbreaks of botulism in the human subject it was noted that a number of fowls became paralysed

and died after eating remnants of the food which had caused poisoning in human beings.

Some of the fowls were subjected to a post-mortem examination, and in the food from the crop and gizzard an anaerobic organism was isolated which had all the morphological and cultural characteristics of *Bacillus botulinus*. Cultures of the bacillus produced a virulent toxin which, on subcutaneous injection, reproduced the typical symptoms and post-mortem lesions in guinea-pigs, rabbits, and cats. The toxin was also fed to fowls and caused the characteristic symptoms.

The fact that it has been shown that the toxin of *Bacillus botulinus* can be formed in certain vegetables and fruits without the addition of animal protein (Dickson, *Journ. Amer. Vet. Med. Assoc.*, 1915, vol. lxv. p. 492) may explain the occurrence of this peculiar disease of fowls under conditions where access to spoiled meats can be excluded.

SEROLOGY AND IMMUNOLOGY.

AUTOPYOTHERAPY (L'autopyothérapie en médecine vétérinaire). BELIN.
Rec. Méd. Vét. Vol. XCII., No. 22. 30th November 1916.
Bull. Soc. Centr. Méd. Vét. 9th November 1916. Pp. 346-350.
(Autopyothérapie.) *C. R. Soc. Biol.* Vol. LXXIX., No. 20.
16th December 1916. Pp. 1093-1095.

TREATMENT OF EPIZOOTIC LYMPHANGITIS BY AUTOPYOTHERAPY (Traitement de la lymphangite épidémique par l'autopyothérapie). BELIN. *Rev. Path. Comp.* No. 130. January 1917. Pp. 7-9.

At the beginning of the war Belin treated suppurating wounds in horses by the subcutaneous injection of pus in which organisms had been killed by the action of ether. But the extreme difficulty in protecting wounds in horses on campaign led him to abandon the treatment. Shortly afterwards, however, Weinberg and Séguin showed the value of pus sterilised by iodin. This led Belin to return to his mode of treatment in the case of horses which suffered from successive crops of small abscesses around the site of a former wound.

The surface of an abscess was treated with tincture of iodin before puncturing, and the pus was collected in a boiled flask. To 4 c.c. of the pus 10 c.c. of ether was added little by little with constant shaking. Then the ether was allowed to act, with frequent shakings, for twelve hours. Finally, 5 c.c. of cold boiled water was added. Thus was produced an almost homogeneous mass.

Treatment of two cases is described. In one of them 1 c.c. was

injected subcutaneously daily for six days with good results. The second case, owing to circumstances, was only injected twice: once with 2·5 c.c. and again, seven days later, with 1 c.c. This also resulted in benefit.

It appears that the *autopyovaccine* produces a negative phase which gradually gives place to a positive phase. In the horse to which daily injections were given the positive phase attained its maximum after the fourth injection; this corresponding to a complete arrest of abscess formation.

It is claimed that the above technique permits of the preparation of an autopsyovaccine outside the laboratory. Though sterilisation with ether is less rapid than with Lugol's solution (as suggested by Weinberg and Séguin), it has the advantage that the ether may remain in contact with the vaccine and may be injected with it; thus keeping the vaccine sterile in spite of possible contamination.

In his third note Belin states that he has employed autopsyovaccine in cases of epizootic lymphangitis with encouraging results. The injections are made daily for from six to ten days. If a cure is not effected by the first series of injections, a second series may be made eight to ten days after the first.

[The first and second papers are alike.]

ON THE PASSIVE IMMUNITY CONFERRED BY A PROPHYLACTIC DOSE OF
ANTITETANIC SERUM. A. T. MACCONKEY and ANNIE HOMER.
Lancet. Vol. CXCII., No. 4877. 17th February 1917. Pp. 259-
261. 8 Tables.

The literature from 1893 to the present time contains many references to the occurrence of cases of tetanus after the prophylactic injection of serum. It is evident from these that the passive immunity conferred by antitoxin is not of long duration. It has been said that after a subcutaneous injection of antitoxin the antitoxin content of the blood reaches its maximum in two or three days, and then remains fairly constant until the seventh day, after which it decreases. It is also said that a sufficient dose of antitoxin gives protection for several days and partial protection for from two to three weeks. The experiments described in the present paper were undertaken to throw light upon this point, and form part of a larger series which have been made with the object of ascertaining the most economical and reliable method of using tetanus antitoxin.

The first object was to discover the smallest quantity of antitoxin which would give complete protection for one week. A number of guinea-pigs were given subcutaneous injections of the same amount of

antitoxin, but the number of units given to each series was different. Seven days later the immunised animals and a series of controls received a subcutaneous injection of tetanus toxin.

The results bring out two points. There are very great differences in the susceptibility of guinea-pigs to tetanus toxin; and apparently enormous doses of serum must be given to produce passive immunity of long duration.

A single prophylactic dose of tetanus antitoxin will not produce immunity of long duration. The balance of recent experience and opinion points to the necessity for giving repeated protective doses in order to keep up the immunity.

SURGERY.

NEW OPERATIVE METHOD FOR CARTILAGINOUS QUITTOR (Nouveau manuel opératoire du javart cartilagineux). M. PERRIER. *Rev. Gén. Méd. Vet.* Vol. XXV., No. 297. September 1916. Pp. 402-410. 5 Figures.

A large number of horses admitted to the veterinary hospital of Arcis-sur-Aube suffered from cartilaginous quittor. Owing to the indifferent results obtained by the classic operation, Perrier varies the technique as follows. The horse is cast, the tourniquet applied, and the operative area disinfected. A horizontal incision is made just above the coronet the whole length of the cartilage. With the sage knife a second curved or semicircular incision is carried from one end of the horizontal incision to the other. The area of skin thus circumscribed includes the fistulous openings and the swollen region over the diseased cartilage. The skin, which is cut obliquely so as to leave a sloping bevelled edge, is now removed, thus exposing the upper portion of the cartilage. Both surfaces of the cartilage are now freed from the adjacent tissues with the right and left sage knives with the exception of the anterior and posterior extremities. The knife, directed along the deep face of the cartilage, has its cutting edge turned outwards and upwards with a turning movement of the wrist during the excision of the main portion of the cartilage. The posterior extremity is then easily detached, followed by the anterior portion. The latter is carefully sliced away, whilst the coffin joint is kept extended to avoid opening the adjacent synovial *cul-de-sac*. The operation is completed by curetting the upper border of the wing of the third phalanx (*os pedis*) with a narrow shoeing knife or curette, thus removing the last traces of

the cartilage. Several advantages are claimed for this method : the wound is completely cicatrised in about six weeks; extirpation of the cartilage is less tedious and less delicate owing to the clear operative field. Nor does any deformity of the foot remain in uncomplicated cases.

The author presents a tabular statement containing particulars of thirty consecutive cases. Of these twenty-seven were successfully treated. The three failures include one horse with necrosis of the collateral ligament, and two horses with arthritis from accidental opening of the joint during the operation.

Several relapses, however, occurred when only a portion of the cartilage was removed. Good results depend, as in the classic method, on complete extirpation. Again, three horses admitted with excessive thinning of the hoof remained lame for a period varying from fifty to eighty-three days. Thinning the wall of the hoof may delay healing, lead to protrusion of the coronary matrix (cushion), deformity of the hoof, and depreciation. Perrier therefore recommends that the wall should be left intact.

(A. W.)

FISTULA OF THE WITHERS. H. E. BEMIS. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 4. 15th December 1916. Pp. 421-423.

Bemis believes that the primary condition in the process of fistula formation is in most cases a serous bursitis. This usually develops rapidly and appears as a uniform, rather soft, hemispherical enlargement on one or both sides of the neck, just in front of the scapula. If this swelling is opened a thin watery fluid and some coagulum escapes. If the distended bursa does not become infected the condition may remain unchanged for an indefinite period, or the fluid may be largely absorbed and a permanent thickening be the result. The author has come to the conclusion that such cases must be treated by drainage as in true fistulae; but the animal should first have its resistance raised by a course of bacterin.

Where there is abscess formation a radical operation is called for. The operation is described as follows:—" Make a triangular incision with the base of the triangle uppermost, 3 or 4 ins. from the top of the neck and 2 to 4 ins. in length. The apex of the triangle should be slightly below the lower border of the rhomboideus muscle so that the sides of the triangle may be 5 or 6 ins. in length. The incision passes through the skin, trapezius, and superficial fascia. When the triangle is removed the rhomboideus is exposed. The operator can now work over the superior border of the rhomboideus into the cavity to trace the fistulous tracts, remove necrotic ligament, and determine the depth of the process. If there is extensive swelling and necrosis an incision

may also be made exactly on the median line and tissue removed through both openings." Proper drainage is essential and must be provided for by other incisions, if necessary.

"RICE-GRAIN" CYSTS (*Les kystes à grain riziformes*). R. BISSAUGE.
Rev. Path. Comp. No. 129. December 1916. Pp. 22-24.

The tuberculous nature of the cysts in man is generally recognised, the infection being mild or latent in character. In veterinary practice they are somewhat rare, and of minor surgical importance. When the tendinous bursæ of man and animals are affected, the cysts are elongated in shape; sometimes they become pedunculated, and, in time, separated from the synovial membrane.

Horses also develop non-synovial cysts, away from joints, on any part of the skin subjected to repeated friction from the harness. Here the shape is spherical or more or less elongated. The contents are always characteristic. On incision a viscid oily yellowish or slightly reddish liquid is discharged containing a quantity of grains varying in size from a millet seed to a lentil or larger. These grains resist crushing; they have a milky appearance and a regular surface somewhat flattened by contact. Hence they have been compared to swollen grains of rice or barley.

In some cases the grains are agglutinated in small masses the size of a hazel-nut; in others they are perforated in the centre like beads. In old cysts the cavity is filled with the grains, the liquid contents being completely absorbed. Six cases of rice-grain cysts are described: two in the horse, situated at the junction of neck and shoulder, and over the atlas respectively; three in cattle affecting the vagina (two cases) and the base of the tail (one case); one in the dog involving the synovial bursæ of the anterior extensors above the carpus. Although none of these animals showed any signs of tuberculous infection, the possibility of its existence in the cysts should be borne in mind. Two of the cattle were subjected to the tuberculin test, with negative results, whilst the third animal was free from any tuberculous lesion after slaughter. All six cases were quickly cured without any relapse. Nevertheless the author recommends the application of the tuberculin test and the bacteriological examination of the cyst contents. (A. W.)

THE TREATMENT OF BURNS BY PARAFFIN. A. J. HULL. *Brit. Med. Journ.* No. 2924. 13th January 1917. Pp. 37-38.

Some time ago Dr. Barthe de Sandfort introduced a treatment of burns, which consisted in painting or spraying the cleansed surface with a proprietary preparation of paraffin known as Ambrine. The composi-

tion of the preparation is a secret one; but the results give the impression that the mode of treatment is a valuable one. Those who have had a large experience with burns treated with picric acid, ointments, etc., are of opinion that the paraffin method is superior to the older methods. The Ambrine preparation has properties which make it more useful than ordinary hard paraffin. It has a lower melting point, is more plastic, and adheres to the skin better.

The first experiments of the writer of the present article were directed towards the discovery of a mixed paraffin which would have the requisite melting point, plasticity, and adhesiveness. A mixture was finally found (containing a small amount of antiseptic) which satisfied requirements. The following is the formula:—

Resorcin	.	.	.	.	.	1 per cent.
Eucalyptus oil	.	.	.	.	2	"
Olive oil	.	.	.	.	5	"
Paraffin molle	.	.	.	.	25	"
Paraffin durum	.	.	.	.	67	"

Instead of resorcin beta-naphthol 0·25 per cent. may be substituted. In this case 67·75 per cent. hard paraffin is used.

The hard paraffin is melted and the soft paraffin and olive oil are added. The resorcin is dissolved in absolute alcohol (soluble 2 in 1) and added to the mixture. Lastly, the eucalyptus oil is added when the paraffin has cooled to about 55° C.

The burn is washed with sterile water and dried by placing a piece of gauze over it. If the burn is septic hot boric fomentations are used for two days.

A layer of paraffin preparation at 50° C. is painted on with a broad camel-hair brush sterilised in wax. A thin layer of cotton-wool, cut to the size of the burn, is now applied, and a second layer of paraffin painted over the wool.

The melted paraffin may be applied with a spray, but sprays are liable to get out of order.

NEOPLASM OF PERIPHERAL NEUROGLIA GRAFTED AND NOT RE-INNERVATED

(Aptitudes néoplastiques de la névroglié périphérique greffée et non réinnervée; conséquences au point de vue chirurgicale).

J. NAGEOTTE and L. GUYON. *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 984-991. 5 Figures.

As the result of experiments on rabbits the authors found in one case that there was an enormous hypertrophy of neuroglia in the graft and at the two ends of the sectioned nerve, with absolutely no regeneration.

tion. In another rabbit the hyperplasia of neuroglia was less, but there was regeneration of the inferior part of the nerve.

The results of the experiments are not solely of theoretical value. They have a practical significance, because they demonstrate the sclerogenous influence of pieces of nerve left in a contused wound. Isolated fragments of nervous tissue should be carefully removed from such wounds, for these débris may determine the formation of a fibrous, adherent, and inextricable cicatrix.

SERUM OSMOSIS. TREATMENT OF WOUNDS BY BLOOD-SERUM OBTAINED BY OSMOSIS (Sérum-osmose. Traitement des plaies par le sérum sanguin obtenu par osmosis). P. CHATELAIN. *Rec. Méd. Vét.* Vol. XCII, No. 13. 15th July 1916. Pp. 393-397.

With the object of producing a free flow of serum by osmosis the author recommends the use of sodium chloride, either in powder or in the form of a solution. When the solution is used the wound should receive an abundant supply. The dressings of an open wound are thoroughly soaked, and applied with gentle pressure. A fistulous wound should be thoroughly syringed with the salt solution and the opening covered with dressing wet with the solution. If considered desirable, powdered salt may be used in the treatment of a fistula. This may be done if the application of dressings is difficult, or if the opening of the fistula is small or directed upwards.

It is claimed that the method has resulted in arrest of suppuration and rapid healing.

FLAVINE AND BRILLIANT GREEN, POWERFUL ANTISEPTICS WITH LOW TOXICITY TO THE TISSUES: THEIR USE IN THE TREATMENT OF INFECTED WOUNDS. C. H. BROWNING, R. GULBRANSEN, E. L. KENNAWAY, and L. H. D. THORNTON. *Brit. Med. Journ.*, No. 2925. 20th January 1917. Pp. 73-78.

After a series of experiments, extending over eighteen months, on various substances, some recognised antiseptics, e.g. ac. carbol, corrosive sublim., iodin, eusol, etc., others not hitherto so recognised or applied, the authors present evidence to show the value of flavine and brilliant green as such—especially flavine.

Flavine, diamino-methyl-acridinium chloride, was originally prepared by Benda at the desire of Ehrlich, and was found to have a very marked therapeutic effect in trypanosome infections. Brilliant green belongs to the diamino-triphenylmethane group.

The disadvantages attending the use of most antiseptics are summarised, viz.:—

1. Reduction of potency in the presence of serum.

2. Destruction of cells and inhibition of phagocytosis.
3. Production of layers of dead material favouring proliferation of micro-organisms.

4. Inefficient penetrating power.

The authors enumerate the properties they consider necessary in an ideal antiseptic, viz.—

1. Great potency against all micro-organisms in the presence of protein material, e.g. serum.
2. No deleterious effect on phagocytosis.
3. Absence of irritant action on living tissues in general, so that it may be applied to delicate surfaces such as mucous membranes.
4. A suitable stimulating effect on connective tissue cells, so as to promote growth of healthy granulation tissue.
5. The compound when absorbed must not be highly toxic for any specialised tissue.

When tested with serum, flavine is the only substance of high antiseptic value whose efficiency is increased. Against staphylococci it is twenty times more powerful than mercuric chloride and 800 times more powerful than carbolic acid or chloramin-T, under these conditions.

To test the effect on phagocytosis, experiments were made in which leucocytes, normal serum, and staphylococci were mixed with varying strengths of the antiseptics. It was found that germicidal potency and inhibition of phagocytosis do not necessarily coincide.

Carbolic acid exerts both effects in strengths of 1 in 250 to 1 in 500, and mercuric chloride in strengths of 1 in 7000 to 1 in 10,000. Brilliant green, on the other hand, kills cocci at 1 in 30,000, and only inhibits phagocytosis at 1 in 2000. Flavine kills both cocci and *B. coli* at 1 in 100,000, but a greater concentration than 1 in 500 is necessary to inhibit phagocytosis. It would thus appear to be the most valuable antiseptic.

In laboratory tests the authors found that a 1 in 1000 solution (equivalent on the basis of bactericidal concentration to an 80 per cent. solution of carbolic acid in the case of staphylococci) could be applied to wounds without causing pain or irritation. It did not injure the skin, and there were no toxic effects even when quantities of the solution were kept in contact for a considerable time.

The wounds so treated granulated well and quickly.

In an appendix on clinical observations on the use of flavine and brilliant green as antiseptics in between two and three thousand cases in the casualty department of Middlesex Hospital, the authors review the results obtained under two main categories, viz.—(1) Cases with suppuration; and (2) cases before suppuration occurred.

In a great variety of cases, e.g. poisoned hands, infected amputation stumps, severe scalp wounds, compound fractures, subperiosteal abscesses, etc., the results obtained with these antiseptics in conjunction with the necessary surgical interference were eminently satisfactory, and in the opinion of the authors markedly superior to those obtained by any method in common use.

They also emphasise the advantage of using flavine as a prophylactic in cases of recent injury—5 to 10 c.c. of 1 to 1000 injected directly into the tissues.

(A. M.T.)

THE INFLUENCE OF ANTISEPTICS ON THE ACTIVITIES OF LEUCOCYTES AND ON THE HEALING OF WOUNDS. C. J. BOND. *Brit. Med. Journ.* No. 2921. 23rd December 1916. Pp. 861-864.
8 Figures. *Ibid.* No. 2927. 3rd February 1917. Pp. 145-148. 6 Figures.

In a previous number of the same periodical (*Brit. Med. Journ.*, 3rd June 1916) Bond has already described a method by which may be studied the activities of leucocytes in closed aseptic wounds and in open granulating tissue. By the application of indigo, carmine, or carbon particles to different kinds of wounds under different conditions of treatment it was possible to follow the three chief phases of phagocytosis—namely, emigration of leucocytes, ingestion of foreign substances, and the return-immigration of loaded cells. From these observations it was suspected that the return-immigration of loaded leucocytes is intimately associated with the phenomena of latent infection and recrudescence of sepsis in wounds. In the present communication further light is thrown on the important problem of return-immigration.

The part played by the fixed tissue cells in infection is a very important one. The observations of Kyes show the important part played by the haemophagic cells of the liver and spleen in destroying pneumococci injected into the general circulation, and Bull has shown that intravascularly agglutinated bacilli ingested by polymorph leucocytes are carried to the liver and spleen and ingested by the cells of these organs. Bond, in the present paper, describes the process of ingestion by the fixed tissue cell of pigment granules carried by leucocytes and the ingestion of pigment granules brought by phagocytes to the liver and spleen cells. The exact method by which the transference of pigment is effected requires further elucidation. It is, however, clear that a close analogy exists between the transportation of pigment by wandering cells and the spread of infection in wounds. The spread of infection is due to a breakdown in one or more of the factors on which phagocytosis depends. Either the wandering phagocytes do not emigrate into the invaded area in sufficient numbers, or, having emi-

grated, they do not ingest the organisms, or the breakdown of the defensive mechanism may occur at a later stage. The organisms may be liberated by the leucocytes while still alive, just as the pigment granules may be liberated, and they may retain sufficient virulence to originate a recrudescence infection in a new area.

If these views be true, it is obvious that any method of wound treatment to be successful must deal with the problem of return-immigration of germ-laden phagocytes. The subject, however, is one of great difficulty. If antiseptic solutions when applied to wounds are sufficiently strong to kill the phagocytes and their cargoes, and so prevent their re-entrance into the tissues, they will also inhibit emigration and phagocytosis. The irrigation of a wound with normal saline favours emigration and ingestion, but does not prevent return-immigration. The application of hypertonic saline, on the other hand, may prevent return-immigration by killing the leucocytes, but it also checks emigration and phagocytosis.

As is well known, the white blood-cells—especially the polymorphs—in some infective diseases frequently give a colour reaction with iodin. This is generally regarded as indicating the presence of glycogen in these cells. Observations show that even in health a large proportion of leucocytes normally give, under certain conditions, a colour reaction with iodin, which is closely related to, if not identical with, the so-called glycogen reaction of disease. The reaction has also been observed in pus cells, the cells of granulation tissue, in marrow cells (neutrophile myelocytes), and in the cells of certain cancerous tumours. It is hoped that chemical examination of the iodophil substance may throw light on the metabolism of the cancer cell.

Time alone will show the part played by the iodophil substance in the process of immunisation against bacterial, and probably other toxic substances.

SPECIFICITY IN ANTISEPTICS. K. TAYLOR. *Lancet*. Vol. CXCII, No. 4878. 24th February 1917. Pp. 294-297. 4 Tables.

After two years' observation and study of several thousand cases of chronic infected wounds and their treatment, the author is driven to the conclusion that there has been little progress. In spite of the numerous new or newly modified methods of treatment, it is still impossible to say "this is the best way to treat an infected wound." He thinks that this is probably due, in part at least, to the failure to consider the individual characteristics of antiseptics in relation to the type of bacteria.

The treatment of a fresh wound is relatively simple, for here the use of an antiseptic is a prophylactic measure, and an attempt to kill

a small number of bacteria before they have fastened upon the wounded tissue. In these cases a single application of a strong antiseptic may be sufficient.

The chief objects of the present paper are to emphasise the need for an analytical study of antiseptics, and to suggest that specificity in the antiseptic treatment of infected wounds is as important as specificity in the antiseptic treatment of systemic infections, such as malaria, syphilis, etc. It is postulated that suppurating wounds may be treated by specific means directed against one single species or group of bacteria at a time.

The paper contains the results of an attempt which has been made to determine the relative activity of a few anti-bacterial substances of varied character against different groups of bacteria, as well as the results of an extensive observation of the bacterial flora of suppurating wounds. The search for a "general antiseptic," in the opinion of the author, has been a stumbling-block to progress.

The antiseptics tested were carbolic acid, cresol, thymol, Dakin's solution, quinin hydrochloride, ammonium and sodium fluoride, salicylic acid, and sodium chloride. The organisms upon which they were tested were *Streptococcus pyogenes*, *Staphylococcus aureus*, *B. pyocyanus*, and *B. aerogenes capsulatus*.

To illustrate the variation in activity, it may be quoted that carbolic acid and cresol were more active against the streptococcus than against the staphylococcus, and had very little activity against the gas bacillus. Thymol showed a fair degree of activity against the streptococcus, but was less active against the staphylococcus, and still less so against the gas bacillus, while it showed practically no action against pyocyanus. Dakin's solution showed a moderate activity against the staphylococcus, was nearly inert against pyocyanus and the gas bacillus, but was more active against the streptococcus.

Clearly *bacterial values are relatively specific and not general*. The concept of the "general antiseptic" must go by the board and the search for a cure-all be recognised as unprofitable.

DISINFECTION OF THE HANDS BY THE EARTHY HYPOCHLORITES. (Procédé de désinfection des mains par les hypochlorites terreaux (magnésie et chaux)). DUBARD. *Bull. Acad. Méd.* Vol. LXXVI., No. 38. 26th September 1916. Pp. 223-226. (Recherches bactériologiques sur l'action des hypochlorites terreaux appliqués à la désinfection des mains). LOCHELONGUE and DUBARD. *Ibid.* No. 43. 31st October 1916. Pp. 334-337.

The difficulty has been to find a disinfectant which would be efficacious without damaging the skin of the surgeon's hands. Dubard

suggests soaking the hands, after washing, for four to six minutes in a solution consisting of—

Chloride of lime of 100° chlorometric . . . 150 grammes

Water 5 litres

to which 180 grammes of sulphate of magnesium have been added.

The hands may afterwards be dressed with—

Olive oil 65 per cent.

Essence of camphor 36 "

Essence of origanum, sage, etc. 4 "

The second paper gives the results of experiments conducted with a view to determining the bactericidal effect of the earthy hypochlorites. The authors conclude that the hypochlorite of magnesium and a mixture of the hypochlorites of magnesium and calcium have about the same bactericidal power. For disinfection of the skin the earthy hypochlorites have given better bacteriological results than iodin.

THE COMPARATIVE RESISTANCE OF BACTERIA AND HUMAN TISSUE CELLS TO CERTAIN COMMON ANTISEPTICS. R. A. LAMBERT. *Journ. Exp. Med.* Vol. XXIV., No. 6. December 1916. Pp. 683-688. 1 Table.

In antiseptic surgery it is important to know the effect of antiseptics upon the tissue cells as well as on the bacteria. Experiments conducted *in vitro* show that while human cells (connective tissue and wandering cells) are highly resistant to many antiseptics, they are in general more easily killed than bacteria (*Staphylococcus aureus*). Of the antiseptics tested, which included mercuric chloride, iodin, potassium cyanide, mercuric iodide, phenol, tricresol, hydrogen peroxide, hypochlorites (Dakin's solution), argyrol, and alcohol, the one which approaches most closely the ideal disinfectant is iodin, which kills bacteria in strengths that do not seriously injure connective tissue cells or wandering cells.

TERATOLOGY.

A CASE OF BILATERAL BIGLANDULAR HERMAPHRODITISM IN A CALF
 (Studio anatomo-istologico ed embriologico di un caso di un *Hermafrodismus biglandularis bilateralis* in un bovino).
 P. VENTURI. *La Clinica Vet.* Vol. XXXIX., No. 18. 30th September 1916. Pp. 543-557. No. 20. 30th October 1916. Pp. 607-616. 2 Plates, 6 Figures.

Naked-eye and microscopic examination establishes this as a case of true glandular hermaphroditism. The animal was a cross-bred calf.

about five months old, a female to all external appearance. There were two testes. The left was lodged in a scrotal sac; the right—smaller than the left—occupied the upper part of the inguinal canal. The epididymides were normal; as were also the deferent ducts, which joined the ejaculatory duct to open into the vagina a short distance from the neck of the uterus. There was only one, the left, seminal vesicle. The prostate was two-lobed, but lacked a pars disseminata. There were no bulbo-urethral glands.

Two ovaries were present, the left being related to the prostate. The left uterine tube was rudimentary, but the right was normally developed. The uterus consisted of a body only, and had a somewhat conical form. It was impossible to distinguish a line of demarcation between the vagina and the vestibule, but it was presumed to correspond to the point of opening of the urethra which occurred about two centimetres from the vulvar aperture. The glans and prepuce of the clitoris were visible on the exterior.

From an examination of the literature the author concludes that this is the first recorded case of *Hermaphrodismus verus biglandularis bilaterialis* in the calf.

TOXICOLOGY.

LOCO-HORSE (Loco-Horse). R. PARENT. *Rev. Path. Comp.* No. 129. December 1916. Pp. 25-27.

The term "Loco-Horse" is applied to a horse which has become toxically affected by the prolonged consumption of "loco-weeds." These grow in Western America, in the region of the Great Plains, extending over North and South Dakota, Wyoming, Montana, and Idaho. The most widely distributed are *Astragalus mollisimus L.*, especially common in the southern part of the Great Plains, and *Oxytropis lambertii L.*, especially found in the northern region. Both are leguminous plants.

In spite of the unpleasant taste these plants possess, horses rapidly come to like them, and will even leave good pasture for the uncultivated districts in which "loco-weeds" grow. Their continued consumption produces in the horse symptoms which are divisible into several phases.

The first phase is one of excitation of the nervous system, apparently of an agreeable nature. The carriage and gait of the horse are altered. The animal steps high with excessive contraction of the muscles of the shoulder. Sometimes, after stopping, the horse seems to be unable to restart without the preliminary performance of certain prancing movements. The neck is arched, the head is carried high, the eye is bright, and the frequent neigh recalls that of the entire.

The first phase is followed by one of dejection and apparent fatigue. The horse has difficulty in keeping up with the rest, and leaves his companions to remain alone in those places where he is certain to find abundance of the "loco-weeds," which he now finds irresistible. The head is carried in the extended position; the eyes are haggard; there is convergent or divergent strabismus; the nostrils are dilated after the manner of those of a horse suffering from colic; neighing is much less frequent.

Unless measures are taken to put a stop to the intoxication, emaciation is rapid. When down, the animal has difficulty in rising. Equilibrium is affected. The limbs tremble; the mouth is open; the head hangs down and the expression is vague. Finally, the horse can no longer rise, and dies of hunger.

American botanists agree that "loco-weeds" contain a narcotic alkaloid, which has not yet been isolated, but which resembles morphin in its effects.

TUBERCULOSIS.

THE WAR AGAINST BOVINE TUBERCULOSIS (*La lutte contre la tuberculose bovine*). LHOSTE. *Rev. Path. Comp.* No. 129. December 1916. Pp. 18-22.

The struggle against tuberculosis has not given the results which were hoped for. The different systems of prophylaxis, though good in theory, have failed in practice. In the United States, in Belgium, in Denmark, almost everywhere, tuberculosis has not abated. On the contrary, unsuspected centres have been revealed, as international statistics show. From figures furnished by the Ministry of Agriculture, it is only possible to conclude that the French sanitary law, based on indemnity, has failed of its object. Its intention was good, but its application has been too difficult.

Concerning the disposal of tuberculous meat, Lhoste asks if it is not a crime to destroy systematically a part of the national resources when science points out that this destruction is not necessary in order to combat tuberculosis. Every scientist admits that the tubercle bacillus cannot resist a temperature above 100° C. when applied for several minutes. In this connection a description is given of the apparatus of M. Wodon, simple and not costly (about 3500 francs), devised for the purpose of sterilising and cooking tuberculous meat.

The oven consists essentially of two concentric iron cylinders, between which water is placed for conversion into steam. The outer cylinder, surrounded by masonry, is heated below and at the sides.

A valve-cock permits the entrance of steam into the interior of the inner cylinder. The meat is thus sterilised and cooked by steam at a pressure of two atmospheres. Into the inner cylinder is run a metal truck with a number of tinned shelves. On each shelf perforated plates are placed, on which the meat is disposed before the operation. The meat should be cut into pieces about 10 cm. to 20 cm. in thickness. Salt, vegetables, and thyme are placed on the meat. The cooking takes three hours, at the end of which time the steam-valve is closed, and another opened to allow of the escape of steam from the interior of the oven. The juices which escape from the meat during the process of cooking are caught in a vessel disposed to receive them, and may be converted into meat-extract by desiccation.

It is claimed that the meat so cooked is extremely appetising. It has the appearance, colour, taste, and odour of meat derived from the healthy animal.

Lhoste proposes that to detect tuberculosis there should be a compulsory annual tuberculin test.

DIAGNOSIS OF TUBERCULOSIS BY COMPLEMENT-FIXATION, WITH SPECIAL REFERENCE TO BOVINE TUBERCULOSIS. A. EICHHORN and A. BLUMBERG. *Journ. Agric. Res.* Vol. VIII., No. 1. 2nd January 1917. Pp. 1-20. 10 Tables, 1 Figure.

With the discovery of tuberculin a great advance was made in the direction of diagnosis of tuberculosis in animals. But its shortcomings have been recognised, not because it is unreliable, but because of the laboriousness of its application, and the possibility of the so-called "doping" of animals for the purpose of preventing a reaction. This practice is known to have been extensively employed in America and Germany, where the authorities, as the result of frequent frauds, have been forced to abandon the test on border importation.

The success attending the use of various biological tests for the diagnosis of infectious diseases directed attention to the possibility of their employment in tuberculosis. The agglutination and precipitation tests held out no encouragement; but the good results obtained with the complement-fixation method when applied for the diagnosis of such diseases as glanders, dourine, contagious abortion, Malta fever, etc., seemed to warrant investigation for establishing the value of the test in tuberculosis, especially since the published results on similar investigations are very contradictory.

In the present investigation 958 samples of serum were tested. Of these 816 samples were of bovine, 120 of porcine, and 22 of human origin. In order to determine whether any relation exists between the

degree of the reaction and the character of the disease it was considered advisable to separate the cases into five groups, according to the lesions found on post-mortem examination, as follows:—

1. Animals which showed no lesions of tuberculosis, and which failed to react to the tuberculin test.
2. Animals which showed arrested lesions with a limited number of slight caseo-calcareous foci confined to the lymph glands.
3. Animals with progressive lesions of a glandular type involving also some of the organs.
4. Animals with well-marked or generalised lesions.
5. Acute and miliary tuberculosis.

The results of the investigation led to the following conclusions:—

The complement-fixation test for the diagnosis of tuberculosis in cattle is not so reliable as the subcutaneous test. Since a large proportion of the positive cases give only a faint reaction, it necessitates a very careful titration of the antigen, and a most accurate observation of all the details of the technique of the test. The amount of fixation cannot be considered as an index to the extent of the infection. Frequently samples from animals showing arrested retrogressive lesions gave a more marked fixation than animals affected with acute, progressive, generalised tuberculosis. The complement-fixation test might be employed as a supplementary test in cases of doubtful or atypical reactions to the subcutaneous or other allergic tests. It is not practical for general diagnostic purposes.

The subcutaneous tuberculinisation of healthy animals affects the results of the complement-fixation test. Such interference may be noted as early as on the fourth day after the injection, and may persist for at least six weeks, and possibly for a much longer time. There is no material difference in the reliability of the test in cattle as compared with human beings. Comparative tests with various antigens proved that one prepared with bacillary emulsion and tuberculin precipitate was the most effective. There appears to be no constancy in the presence of antibodies in tuberculous animals.

An extensive bibliography is given.

THE CULTIVATION OF THE TUBERCLE BACILLUS DIRECTLY FROM SPUTUM AND POST-MORTEM MATERIAL. M. B. SOPARKAR. *Indian Journ. Med. Res.* Vol. IV., No. 1. July 1916. Pp. 28-40.

The method here described appears to permit of the cultivation of the tubercle bacillus direct from almost any kind of tubercular material. The procedure is as follows:—

A mixture is made of equal parts of the suspected material (2 to

10 c.c.) and a 5 per cent. soda solution. This is kept at a temperature of 37° C. for half an hour, and is then neutralised with a 5 per cent. solution of HCl. The best point of neutralisation is shown by the appearance of a very slight milkiness in the fluid. The liquid is now centrifugalised at a high rate of revolution, and the deposit used for the inoculation of media. The writer prefers an egg-albumen medium, with or without glycerin.

According to the above method all organisms are killed except those of tuberculosis, which may therefore be obtained in pure culture. One of the chief advantages of the method is that the loss of tubercle bacilli is reduced to a minimum.

LOCAL SENSIBILITY TO TUBERCULIN (Ueber die Hervorrufung der lokalen Tuberkulinempfindlichkeit). G. BESSAU. *Berl. klin. Wochenschr.* 17th July 1916. Pp. 801-806.

The sensibility of the tuberculous to tuberculin is due, not to antibodies, but to the presence of certain elements, not as yet defined, of tubercular tissue called "tuberculocytes" by Bessau. Tuberculin coming into contact with these tuberculocytes produces an anaphylactic poison which causes the local and general reaction. The local reaction at the point of injection is a manifestation of defence, and indicates that the organism is capable of producing tubercular tissue under the stimulus of the tuberculin.

In advanced cases of tuberculosis the general reaction is marked, while the local reaction is feeble. In slow tuberculosis, or tuberculosis in process of cure, the reverse is the case.

TUBERCLE BACILLI IN EXPECTORATION LIQUEFIED WITH PYRIDIN (Recherche des bacilles tuberculeux dans les expectorats fluidifiés par la pyridin). M. GIRAUD and M. DUMONT. *C. R. Soc. Biol.* Vol. LXXIX., No. 18, 18th November 1916. Pp. 976-977.

The technique suggested by the authors is claimed to be easy and rapid, and by it the long procedure with hypochlorites (Lannoise and Girard) with or without fractional precipitation (Bierry) may, most frequently, be avoided.

To 10 c.c. of expectoration 15 c.c. of pyridin is added. Mix well with an agitator. Let the mixture stand until there is complete liquefaction. Generally this is a matter of a few minutes (5 to 10) only; but there is no disadvantage in allowing the expectoration to remain in contact with the pyridin for a longer time. The authors

have made excellent preparations from sputum which has been in the pyridin for thirty-two hours.

Centrifugalisation with an electric Jouan centrifuge, model C, at the second speed, is effected in from three to five minutes.

The action of pyridine in the cold is less harsh than that of soda or the hypochlorites with heat. Cellular elements are not destroyed, and the connective tissue resists the action of the pyridin.

THE TUBERCLE BACILLUS IN SPUTUM AND VARIOUS ORGANIC FLUIDS
(Sur la recherche des bacilles tuberculeux dans les expectorations et les divers liquides de l'organisme et sur la recherche des fibres élastiques). H. BIERRY. *C. R. Acad. Sci.* Vol. CLXIII., No. 21. 20th November 1916. Pp. 618-621.

It is claimed for the following technique that it can be employed for the detection of the tubercle bacillus, not only in expectorations, but in different organic fluids, such as blood, exudates and transudates, cerebro-spinal fluid, pus, milk, etc. Bierry has already described a method by which sputum is liquefied with the production of a precipitate in which the tubercle bacillus is entangled (*C. R. Acad. Sci.*, vol. clxiii. 1916, p. 110).

Liquefaction of the sputum is obtained by the addition of a very small quantity of hypochlorite of sodium and dilute NaOH at a temperature of about 35° to 40° C. To the mixture is added, drop by drop, dilute acetic acid until there is a slight acid reaction accompanied by the appearance of a precipitate, which is rapidly deposited by centrifugalisation. The small amount of viscous mass contains the tubercle bacillus, mucin, nucleo-proteins, and alkali-albumins.

REPORT.

OXFORDSHIRE EPIZOOTIC ABORTION EXPERIMENTS. Second Report.
June 1916. Pp. 26.

In a former series of experiments conducted by the Education Committee of the Oxfordshire County Council during the years 1911-13, fourteen infected herds, including 671 cows and heifers, were under observation. The results have already been published in a First Report (1913). They may be summarised as follows:—Before the experiments began (during 1910) 28·9 per cent. (*i.e.* about one in every four animals) aborted. After Anti-Abortion A treatment 6·3 per cent. (*i.e.* about one in every fifteen animals) aborted. After Anti-Abortion B treatment 15·1 per cent. (*i.e.* about one in every seven animals) aborted. Among those not inoculated and left as “controls” 19·1 per cent. (*i.e.* about one in every five animals) aborted. The treatment, therefore, reduced the abortions from about 28 per cent. to about 6 per cent. These results were so good that a continuation of the experiments was determined upon.

The Second Report deals with experiments conducted during the period 1914-16. The work during this period was on rather an extensive scale. Over 1289 animals in thirty-eight herds have been inoculated. In the first place, it was decided to continue the A treatment in some, if not all, of the fourteen herds inoculated during the period 1911-13; the object being to find out, if possible, how long it is necessary to continue inoculations on a farm, and also whether one inoculation is sufficient to immunise an animal for longer than one pregnancy. The policy which was followed on the majority of farms was to inoculate every “empty” animal during the first year, and then to inoculate all heifers and bought-in cows each year afterwards, until abortions cease to occur. On a few farms every empty animal was immunised for two years running.

The results of the second series of experiments may be summarised as follows:—Before the experiments began (during 1913) over 30 per cent. (*i.e.* at least one in every four animals) aborted. After A treatment 5·7 per cent. (*i.e.* about one in every seventeen animals) aborted. Among the controls 20·7 per cent. (*i.e.* about one in every five animals) aborted. Briefly, the treatment cut down the number of cases of

abortion from above 30 per cent. to about 5 per cent. This is a similar result to that obtained with the A treatment in the 1911-13 experiments.

While the general result of the first period's experiments on fourteen herds was to reduce the number of abortions from about 28 per cent. to about 6 per cent., the continuation of the second period's experiments on the same herds was a further reduction to less than 2 per cent.

Of 237 animals which were immunised in the period 1911-13 only six can be discovered as having aborted in the period 1914-16, so that one inoculation appears to have been sufficient to immunise the majority of the animals for longer than one pregnancy.

The results obtained in each individual herd seem to point to the following general conclusions :—

It is necessary to continue the inoculations for a time on the infected premises after abortions cease to occur.

Inoculations should be carried out in an infected herd until abortion has ceased, but if the herd is one which is re-stocked by buying in fresh non-pregnant animals, these animals should always be inoculated.

If pregnant animals are bought, they may reintroduce infection.

Although very few animals which have been immunised for one pregnancy have aborted at subsequent pregnancies, it appears that if an animal is immunised for two pregnancies running, there is very little chance of the animal aborting afterwards.

The vaccine used in these experiments was supplied by the Board of Agriculture and Fisheries.

REVIEWS.

HORSES. By ROGER POCOCK. London: John Murray. 1917. Pp. x.
+ 252. 6s.

It may as well be confessed at the outset that the present reviewer has been under a very strong temptation to make his review simply a collection of extracts from this entertaining, instructive, and eminently readable book by the founder of the League of Frontiersmen; and probably nothing better can be done to show the general trend of the book than to quote an appreciative preface written by Professor J. Cossar Ewart.

"Roger Pocock's book is in many ways remarkable. It affords evidence of far more erudition than seems compatible with the unsettled and busy life of a frontiersman. In some parts it is highly speculative, deals with problems rarely discussed or even mentioned by hippologists; in others it is severely practical, and affords evidence of close study of horses and horsemanship in all parts of the world. The more the reader knows of cosmic changes and of the origin, history, and habits of horses, wild, feral, and tame, the more he is likely to be fascinated by *Horses*. The chapters on the history of the horse and on horsemanship are highly suggestive and interesting, but at the moment those on the pleasure horse and the soldier horse claim and deserve most attention. We soon forgot about the loss of over 300,000 horses in the Boer War, with the result that when the world war broke out in 1914 we were as deficient in horses as in men and munitions. If the suggestions made by a horse-master, who knows more about range than indoor or pleasure horses—suggestions as to breeding, rearing, and management of military horses—are duly considered, we may have an ample supply of suitable horses for our next war."

Nor can an indication of the author's style, point of view, and humour be better given than in the following sentences from his Introduction :—

"In the world where the horse lives there is one god. This god is only a human creature, soldier by trade, stock-rider, groom, or drayman, but from him all things proceed. So far as the horse knows, his god made the girth-gall and the harness, the oats and the weather, and most certainly provides a lump of salt to lick, a canter over turf, or any other little scrap of Heaven which falls into the world. . . . To get better horses one must improve the strain of gods. As a god of horses I was never a success, however hard I tried to live up to a difficult

situation. I attempted, for example, to learn about my horses from scientific books, yet found the scientific writer rather trying. He calls an animal who never injured him by such a name as *Pachynolophus*. This may be safe enough behind the animal's back, provided the philosopher makes quite sure that it is really and truly extinct. But suppose he met one, would he call it a perissodactyl ungulate to its face? Not at all! He would shin up a tree and use worse language than that."

As might be expected, the author has little sympathy with our method of housing horses. He would make radical changes in the construction of our stables. "There should be no walls, but the stable should be built like a Japanese house, with transparent and portable screens, close fitting against draughts, which can be set up on two windward sides with every shift of the weather. By no other means can the diseases be swept away which make the stabled horse a byword for unsoundness.

Nor does he think much of the pleasure horse. As for hunting and racing . . . "In the throes of war for our existence, while every luxury must be dispensed with and every available man called to the colours, the British Government is solicitous to preserve hunting and racing. The authorities would preserve the trade of horse-breeding lest there be scarcity of army remounts. Let us breed pleasure horses, they tell us, in order to secure a stock of working horses. So let us encourage yachting to give us ships for cargo. Let us breed guinea-pigs as material to coin guineas."

Though, as has been confessed, the temptation is great, it would be a shame to forestall the reader's pleasure by more copious quotation. After saying "Get the book and read it for yourself," let an end be made of a review which is no review by the transcription of the author's concluding sentences.

"In the past the horses carried our ancestors out of savagery through barbarism into civilisation. They saved us from the barren labour of Chinese, Egyptian, and Indian cultivators, and gave us the large opportunities of our country life. Horses and shipping added all the continents to our estate, the conquest of the world to our arms, the glamour of adventure to our history. If only we can learn to understand horses with a quicker sympathy, a bolder reasoning, the training which our fathers had as horsemen will be bettered in the training of our sons."

THE PATHOLOGY AND DIFFERENTIAL DIAGNOSIS OF INFECTIOUS DISEASES OF ANIMALS. By VERANUS ALVA MOORE, B.S., M.D., V.M.D. Fourth Edition, Revised and Enlarged. New York: The Macmillan Co. 1916. Pp. xvi. + 593. 120 Illustrations. 17s.

When, in 1902, the Professor of Comparative Pathology in the New York State Veterinary College produced his book on infectious diseases he filled a blank. That his book has gone through three editions in fourteen years proves this. That the present edition will have to give place to another before many years have passed is evident.

Though the present edition has been revised, much of it rewritten, and numerous additions made to it, it would be possible for the British reader to feel occasional disappointment were it not that the author disarms criticism on the score of incompleteness by pointing out the limits which are set by the size of a workable text-book. The reader in this country will also remember that the book was prepared for the American practitioner and student. Deficiencies, however, have in a measure been compensated by lists of references, which should be found useful to anyone wishing to pursue further any given subject.

Though the point is a small one, we are a little puzzled in places to find a reason for some of the arrangement of the subject-matter. It is not quite clear, for example, why certain specific diseases are dealt with in Chapter I., which, at the outset, promises to be a consideration of general questions only. Nor do we see why infective sarcomata in dogs should be included under "Distemper."

The reader will bear in mind that the classification of bacteria according to Migula is followed. Hence the causal organism of such diseases as anthrax, glanders, and tuberculosis is referred to as a *bacterium*, and not as a *bacillus*.

Where the illustrations as a whole are good one hesitates to recommend the author to do away with Fig. 9—the so-called "glanders expression"—when the next edition is called for. We are not referring so much to the "expression" of the horse therein depicted, but to the perspective. It seems as though the photograph had been taken with a wide-angle lens. This is only an aesthetic blemish, and it is perhaps hardly worth while drawing attention to it.

A satisfactory index adds value to the book, and the publishers are to be congratulated in having resisted the temptation to use "art" paper.

THE ENDOCRINE ORGANS: AN INTRODUCTION TO THE STUDY OF INTERNAL SECRECTIONS. By Sir EDWARD A. SCHÄFER, LL.D., D.Sc., M.D., F.R.S. London: Longmans, Green & Co. 1916. Pp. ix. + 156. 104 Figures. 10s. 6d.

It is probably safe to say that in no department of physiology has recent advance been greater than in the study of what were once called the ductless glands, and are now known as the endocrine organs. In Biedl's *Innere Sekretion* bibliography alone occupies 250 large octavo pages, and in Swale Vincent's *Internal Secretions and the Ductless Glands* 2000 references to literature are given. No one but the narrow specialist, therefore, can possibly be familiar with all that has been written on the subject of recent years. And the subject is not one for the specialist alone. The clinician and practitioner can no longer afford to remain in ignorance of recent discoveries respecting the physiological and pharmacological action of the internal secretions. Although it must be confessed that some disappointment has been felt by the clinician when he has sought to apply some of the

results of the laboratory, it is beyond question that other results have placed potent agents in the hands of the practitioner : as witness adrenalin.

For the above reasons Sir Edward Schäfer has conferred a lasting benefit upon applied science in succinctly and clearly bringing within the reach of the clinician a readable account of knowledge of the internal secretions as demonstrated up to the present.

The book is founded upon a course of lectures delivered at Stanford University, California, in 1913. The lectures were issued in the following year, but in an abbreviated form and without illustrations. The substance of the lectures is now published in a revised form, with the addition of the tracings and photographs which were used to illustrate them.

The term *endocrine* is applied to an organ which forms some specific chemical substance within its cells, and passes it, either directly or indirectly, into the blood-stream. To this substance the term *hormone* has been given ; but Professor Schäfer points out that some of these substances have the power of stimulating or exciting cell functions, while others inhibit or depress these functions. He, therefore, proposes to limit the application of the name *hormone* to those which stimulate or excite activity, using the term *chalone* for those which diminish or inhibit activity, the collective name of *autacoid substances*, or *autacoids*, covering both classes. Hormones, therefore, are *excitatory autacoids* ; chalones are *inhibitory autacoids*. There are consequently *hormonic* and *chalonic autacoids*.

That the veterinary reader will find much between the covers of the book with which he should be familiar goes without saying ; but his attention will probably be arrested in the first cursory survey by photographs illustrating the effects of removal of the thyroid from sheep and the hypophysis (pituitary) from dogs.

THE BIOLOGY OF TUMOURS. By C. MANSELL MOULIN, M.A., M.D.(Oxon.).
London : H. K. Lewis & Co. 1916. Pp. 55. 2s. 6d.

Though largely in the realms of the speculative, the thesis of Dr. Moulin's book will be found stimulating and provocative of thought. The origin of tumours is explained in a novel way, the point of view being decidedly unusual. Stated in brief, Dr. Moulin's thesis is as follows :—In the beginning the cell was non-sexual and reproduced asexually. In the higher metazoa the cells have lost their primitive power of asexual reproduction under normal conditions. The somatic cells, being highly specialised, reproduce on lines entirely different from those followed by the primitive cell. Normal germ-cells also reproduce along specialised lines ; this under normal stimulation. Subject either the somatic cells or the germ-cell to abnormal stimulation, thus checking their normal development, and there will be reversion to the asexual mode of reproduction, with the consequent attempt at the formation of a new generation or bud ; that is, a tumour is formed.

Further, if the parent cell from which the tumour has developed be in an actively growing embryonic state, the tumour will be of great malignancy.

If, on the contrary, the parent cell has already approached its destined perfect form before the stimulus to asexual reproduction operates, a non-malignant tumour is the result.

Stated in other words, every cell has in it an inherent latent capacity for asexual reproduction, but to free this power a stimulus, such as local irritation, is needed.

Dr. Moulin finds it necessary to recognise a second class of tumour, due to arrest of the normal evolution or involution of a tissue. Such a class is necessary in order to explain conditions such as cysts found in the remains of the Müllerian and Wolffian ducts.

When an author strikes out on a line of independent speculation, he must be prepared to receive a measure of criticism and, may be, opposition. Doubtless, Dr. Moulin is prepared for this. Anyway, he deserves to be read and pondered.

AGRICULTURE IN OXFORDSHIRE. By JOHN ORR. Oxford University Press.
1916. Pp. xii. + 239. 8s. 6d.

This is described as the first of a series of monographs on the English Counties, prepared by the Institute for Research in Agricultural Economics in the University of Oxford. If it can be taken as a fair sample of what the series, as a whole, will be like, we can only say that the final result of the Institute's labours should form an exceedingly valuable addition to the literature of agricultural economics.

Mr. Orr has performed his work in an altogether admirable manner, and is especially to be congratulated on the possession of a pen which makes eminently readable a "survey" which might easily have degenerated into a bald and uninteresting recital of facts. He has found it advisable to divide the county into certain districts—the Chilterns, from the Chilterns to Oxford, north Oxfordshire, south-west Oxfordshire, and north-west Oxfordshire. This subdivision is desirable on account of different geological and economic conditions in different parts of the county.

Though it is scarcely conceivable that anyone even remotely interested in agriculture can fail to find something to appeal to him on nearly every page, certain sections—notably those on live stock—will make especially profitable reading for the veterinary surgeon.

We are told that—

"Cattle in Oxfordshire are chiefly shorthorns, and of these the majority are dairy shorthorns. For milk purposes Holstein Friesians have been kept on a few farms—at Blenheim among other places. Jerseys and Guernseys are also found in some places, but they count for little in the total. There is one herd of longhorns at Rousham, and a herd of the old English wild white cattle at Wilcote."

An experiment in crossing dairy shorthorns with the Hereford is mentioned for the instruction of any inexperienced person who may contemplate

anything of the kind. The first crosses from a Hereford bull are successful, giving a normal supply of milk, but the offspring of these crosses only give a fraction of the average shorthorn. There is a widespread opinion that this crossing is causing serious injury to the dairy stock of the county. In connection with the dairy herds, it is interesting to learn that farmers in north-west Oxfordshire with a large number of cows prefer the milking-machine to the hand in every respect, "the udders of cows being less apt to go wrong since it has been in use." This statement would have been more valuable had it been supported by statistics.

Increase in the number of cattle in the county has been considerable. In 1866 there were 42,135 head of all kinds; in 1914 the number had risen to 69,053 — that is to say, the increase in Oxfordshire was 11·5 per cent.; whereas in England, as a whole, it was only 8·6 per cent. "In connection with cows, one satisfactory feature is the increasing number of herds in which a high standard of breeding has been attained. The cows are non-pedigree, but there has been a great improvement within recent years."

The number of horses has also increased. From 1884 to 1914 the increase was 8 per cent., though in England, as a whole, for the same period there had been a decrease of 9 per cent. It is curious that this increase has taken place in spite of the fact that the acreage of arable land has diminished.

"Shire horses do the work on most farms. A few Clydesdales and lighter horses of nondescript breeds are used here and there, but Oxfordshire farmers, particularly those who have farmed longest in the county, have a decided preference for the Shire, with his steadier pace in working heavy soils."

Sheep, unlike cattle and horses, have decreased heavily. In the period 1885 to 1914 sheep in England, as a whole, decreased by 19 per cent.; but in Oxfordshire the decrease amounted to 43 per cent. Pigs also have declined in number.

It should be noted that the survey was made in the spring and summer of 1914. It does not, therefore, reflect any of the abnormal conditions which have arisen during the past three years.

FORM AND FUNCTION: A CONTRIBUTION TO THE HISTORY OF ANIMAL MORPHOLOGY. By E. S. RUSSELL, M.A., B.Sc., F.Z.S. London: John Murray. 1916. Pp. vi. + 383. 10s. 6d.

Although the author disclaims any intention to give a full and detailed history of animal morphology—a task impossible within the limits he has set himself—he nevertheless encompasses a very complete summary of the more important phases of biologic thought from the time of Aristotle to the present day, with an astonishing amount of detail compressed into relatively small space. Apart altogether from the lucid exposition of historic views and theories, discussions, and speculations, Mr. Russell's book will be of great

value for its wealth of references. He may fairly claim that he has omitted scarcely any of the epoch-making publications with which the morphologist should be acquainted.

It is obvious that there are two ways of regarding form and function. Either may be held as dependent upon the other. The transcendentalist sought to prove that function is governed by form, and, consequently, when function needs modification there must of necessity be a departure from the type in form. Homologies were looked for with surprising results. That "the theory of the repetition or multiplication of parts within the organism," with the resultant recognition of serial homologies, did much to advance morphology will scarcely be disputed. But that the search for homologies led to absurd speculation is illustrated by the views expressed by J. F. Meckel.

"Not only, he says, are the right and left halves of the body comparable with one another, but also the upper and the lower, the dividing line being drawn at the level of the diaphragm. The lumbar complex corresponds to the skull, the anus to the mouth, the urinogenital opening to the nasal opening; in general, the urinogenital system corresponds to the respiratory, the kidneys to the lungs, the ureters to bronchi, the testes and ovaries to the thymus, the prostate and the uterus to the thyroid gland, and the penis and clitoris to the tongue."

This illustration is possibly unfair, because extreme; but it serves to show to what lengths the German transcendentalist was prepared to go.

The view that form is a manifestation of function is that with which Mr. Russell is in sympathy. He is persuaded—as indeed all morphologists are—that the study of form is useless without the correlation of function; and recalls how Etienne Geoffroy Saint-Hilaire endeavoured to found a science of pure morphology and failed. "His failure showed, once and for all, that a pure morphology of organic form is impracticable."

Though he leaves no doubt in the mind of the reader as to which school of thought he favours, Mr. Russell is scrupulously fair in his presentation of diverse views. Not a little of the value of his work reposes upon his fairness of exposition and ability to enunciate theories without displaying bias.

We are so familiar with the "cell theory," and so incorporated is it in our daily work and thought, that we are apt to forget that it was not until nearly the middle of last century that Schwann laid the foundations upon which rests our present knowledge of the analysis of the animal body. Mr. Russell will no doubt be one of the first to recognise that there are those who scarcely feel it possible to agree with him in his statement respecting the influence of the theory. "The influence of the cell theory on morphology was not altogether happy. The cell theory was from the first physiological; cells were looked upon as centres of force rather than elements of form, and the explanation of all the activities of the organism was sought in the action of these separate dynamic centres. There resulted a certain loss of feeling for the problems of form. The organism was seen no longer as a cunningly

constructed complex of organs, tissues, and cells ; it had become a mere cell-aggregate ; the higher elements of form were disregarded and ignored."

Did space permit it would be possible to show that these words can only be accepted with a certain amount of reservation. If the cell-theory had done nothing else it would have advanced morphology, inasmuch as it paved the way for that immense volume of research which has had a potent influence on speculations respecting hereditary transmission. Sight should not be lost of the fact that the cell theory of to-day is not quite the same thing as the cell theory of Schwann. Moreover, views regarding the cell are likely to undergo considerable modification in the near future, as witness the revolt initiated by Sedgwick and Whitman against the conception that the organism is merely an aggregation of discrete self-centred cells.

The author's hopeful view of the morphology of the future is shown in the following words :—" One may hazard the opinion that the present century will see a return to a simpler and more humble attitude towards the great and unsolved problems of animal form. Dogmatic materialism and dogmatic theories of evolution have in the past tended to blind us to the complexity and mysteriousness of vital phenomena. We need to look at living things with new eyes and a truer sympathy. We shall then see them as active, living, passionate beings like ourselves, and we shall seek in our morphology to interpret, as far as may be, their form in terms of their activity."

VETERINARY THERAPEUTICS. By E. WALLIS HOARE, F.R.C.V.S. Third Edition. London : Baillière, Tindall & Cox. 1916. Pp. xxiv. + 943. 18s.

This work has been rewritten and enlarged without departing from the general plan of former editions.

Part I. deals with the general symptoms and diagnosis of disease, and includes useful chapters on the care, management, and nursing of the various animals, written by experienced practitioners.

Part II. consists of *materia medica*, with a special chapter on vaccine and serum therapy. The author considers that the student of *materia medica* is overburdened with much unnecessary detail regarding the composition and preparation of drugs, and accordingly scarcely touches on these points, but the preparations used in practice and their actions, uses, and doses are fully dealt with. With this view one feels bound to agree, and in this connection the quotation on the fly-leaf from Froude seems particularly apt.

In Part III. the treatment of the more common diseases is discussed, and a large number of serviceable formulæ are given under the different headings.

Altogether it is a useful volume, especially for the student of *materia medica*. It should give him a new interest in what ordinarily is the driest subject in his curriculum, and also be a handy book of reference when he begins the study of medicine.

(A. M.T.)

NOTES ON BOOKS.

LES APPAREILS PIATRÉS. By JACQUES CALVÉ and MARCEL GALLAND.
Paris : Bailliére et Fils. 1917. Pp. 88. 109 Figures. 2.50 fr.

While plaster-of-Paris is in some measure used by the veterinary surgeon in this country, it is not so extensively employed by him as by the human surgeon, and neither of them employ it so extensively as does their French confrère. This small handbook will probably point out many directions in which plaster apparatus might with advantage be turned to account in veterinary surgery, and more especially in connection with the smaller animals.

THE CARE OF THE HORSE AND MULE. By R. J. DAY. London : Ernest J. Day & Co. 1916. Pp. 44. 27 Illustrations. 2s.

POINTS OF THE HORSE. London : Ernest J. Day & Co. 1917. 9d.

Apart altogether from their utility, these publications give an indication of the renewed and widespread interest which has been evinced in all that appertains to the horse since the war began. Lieutenant Day's avowed object in producing his small book "is to assist those whose duties are with the Machine Gun Transport. It should also be found useful to all officers who are to be mounted. As it is considered a point of honour for the machine gunner to keep his gun firing under all circumstances, so it should be a point of honour for the driver to keep his animal always in a fit condition and ready for any emergency."

CLINICAL BACTERIOLOGY AND HÆMATOLOGY. By W. D'ESTE EMERY, M.D., B.Sc.(Lond.). Fifth Edition. London : H. K. Lewis & Co. 1917. Pp. 344. 9s.

This book is designed, as the title indicates, as a guide to the practitioner in the collection and examination of pathological material for purposes of diagnosis. It contains 11 plates and 35 figures.

FARM BUILDINGS AND BUILDING CONSTRUCTION IN SOUTH AFRICA. By W. S. H. CLEGHORNE, B.Sc., A.M.I.Mech.E. London : Longmans, Green & Co. 1917. Pp. xxiv. + 328. With 235 Diagrams. 2ls.

A GLOSSARY OF BOTANIC TERMS, WITH THEIR DERIVATION AND ACCENT.
By B. D. JACKSON. Third Edition. London: Duckworth & Co.
1916. Pp. 427. 7s. 6d.

This glossary is prepared by the Secretary of the Linnean Society in order that the student may have a handy book of reference in which he can find concise definitions of such botanical terms as he may meet in the course of his reading. The present edition of the glossary contains some 21,000 terms.

THE DIAGNOSIS AND TREATMENT OF HEART DISEASE. By E. M. BROCK-BANK, M.D.(Vict.), F.R.C.P.(Lond.). Second Edition. London: H. K. Lewis & Co. 1916. Pp. 120. 3s. 6d.

OUR WEIGHTS AND MEASURES. By ALLAN GRANGER. London: Eyre & Spottiswoode. 1917. Pp. 18. 6d.

The subtitle, "A Suggested Simplification and an Approach to the Metric System," shows that this pamphlet is of the nature of a suggested compromise. It is suggested that a complete change to the metric system would mean a serious disturbance of trade customs and social habits, and would involve considerable cost. But, according to the author, the breaking with the past would be the most serious consequence. A partial change is considered as the most expedient course.

LATIN FOR PHARMACISTS. By GEORGE HOWE, Ph.D., and J. G. BEARD, Ph.G. Philadelphia: P. Blakiston's Sons & Co. 1916.

Intended for pharmacists, this should be useful to all who desire to write prescriptions correctly.

INSECT ENEMIES. By C. A. EALAND. London: Grant Richards. 1916. Pp. xiii. + 223. 53 Figures. 6s.

When 200 insect pests affecting forestry, agriculture, horticulture, and domestic animals are considered in a book of hardly more than as many pages, it is fair to assume that the work has been done primarily for the instruction of the lay public. But, on this account, the book need not be neglected by the professional reader. He who would extend his knowledge is catered for by a bibliography arranged according to natural orders.

A HAUSA BOTANICAL VOCABULARY. By J. M. DALZIEL. London: T. Fisher Unwin. 1916. 6s. 6d.

This vocabulary, without being descriptive, gives the Hausa name, the botanical identification, and a short definition of a large number of plants known by name and local use to the Hausas. It should be useful to those who have to work among the Hausas of British Nigeria.

THE PROBLEM OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY AND OF METABOLISM. By Dr. OTTO VON FURTH. Translated by ALLEN J. SMITH. Philadelphia and London : J. B. Lippincott Co. 1916. Pp. xv. + 667. 25s.

AIDS TO BACTERIOLOGY. By C. G. MOOR and W. PARTRIDGE. Third Edition. London : Baillière, Tindall & Cox. 1916. Pp. viii. 278. 3s. 6d., Cloth ; 3s., Paper.

ENCYCLOPÆDIA MEDICA. Under the general editorship of J. W. BALLANTYNE, M.D., etc. Second Edition. Vol. IV. Ear to Filariasis. Edinburgh and London : W. Green & Son. 1916. Pp. 685. 20s.

Though now known under the above name, this publication forms a new edition of the deservedly celebrated *Green's Encyclopaedia of Medicine and Surgery*. The fourth volume, which is now before us, contains several sections, both long and short, which might be consulted with profit by the veterinary surgeon. Among them may be mentioned those on embolism, enzymes, ether, and filariasis.

The article on "Enzymes" may be chosen as an illustration of the manner in which current views have been incorporated into the new edition of the *Encyclopaedia*. The importance of the subject cannot be overestimated, its relations to pathology being of the closest. The article has been rewritten and thoroughly modernised, so that anyone consulting it may be sure of having before him a succinct but sufficiently comprehensive survey of what was known up to the time of writing.

BIBLIOGRAPHY.

A note on a paper under this heading does not preclude a fuller abstract in a later issue.

ANATOMY (Including Embryology).

HOPKINS, G. S. "The Innervation of the Muscle Retractor Oculi." *Anat. Record.* Vol. XI., No. 5. December 1916. Pp. 199-206. 1 Figure.

Repeated dissections of the horse, ox, sheep, pig, dog, cat, and rabbit have shown that the *N. abducens* supplies all portions of the *M. retractor oculi*. In no case was there found any indication of filaments from the *N. oculomotorius* to the muscle as stated in so many of the text-books.

HUBER, G. C. "A Note on the Morphology of the Seminiferous Tubules of Birds." *Anat. Record.* Vol. XI., No. 4. November 1916. Pp. 177-180. 1 Figure.

REITTERER, E. "The Integument of the Glans and Prepuce of the Bullock." (De l'évolution des téguments glandulaire et préputial du bœuf). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 996-1000.

— and NEUVILLE, H. "The Glans Penis of the Bullock" (De la conformation et de la texture du gland du bœuf). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 993-996.

CLINICAL.

BOND, P. G. "Intussusception of the Small Colon of the Horse." *Vet. Record.* Vol. XXIX., No. 1484. 16th December 1916. Pp. 248-249.

The author believes that it is possible for the blood-vessels of the intestines to contain nearly the whole of the blood of the body, and the drawn-out, strained intestine being unable to contract properly, this injury to living tissue leads to inflammatory action.

BURGON, A. P. "Death of a Shire Mare from Pneumonia Following a Necrotic Wound in the Heel of the Off Hind Limb." *Vet. News.* Vol. XIV., No. 686. 24th February 1917. P. 78.

"The peculiar features of this case were the normal temperature and mucous membranes; also, although there were evidences of pronounced lung lesions, there was no respiratory acceleration until the last twenty-four hours."

"CANIS MAJOR." "Post-mortem Lesions." *Vet. Record.* Vol. XXIX., No. 1489. 20th January 1917. Pp. 299-300.

Contains an account of six post-mortem examinations—four in dogs, and two in cats. One was that of a bull-dog, with "a large flat cork, one of the pickle-bottle variety, firmly wedged in the pylorus." There had been a good appetite throughout the illness.

— "The Operation of Gastro-tomy and Enterectomy Upon the Dog." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. Pp. 66-69.

CARTWRIGHT, C. W. "Complications." *Vet. News.* Vol. XIV., No. 685. 17th February 1917. Pp. 66-67.

Retention of the placenta in a cross-bred shorthorn cow led to septic metritis. On the fourth day there was severe laminitis. This was followed in succession by acute mammaitis and pneumonia. The symptoms were treated as they arose, but the chief medicines used were quinin and stimulants, with the free use of nuclein. The animal recovered.

HOARE, E. WALLIS. "Abdominal Tuberculosis." *Vet. News.* Vol. XIII., No. 677. 23rd December 1916. P. 532.

Record of a case in a seven-year-old Kerry cow.

HOBDAY, F. "Cyst of the Epiglottis in a Horse." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. P. 401.

HOWARD, P. J. "On Lameness." *Vet. News.* Vol. XIV., No. 679. 6th January 1917, Pp. 5-6.

HUDSON, R. "Neuroma of the Fifth Pair of Cranial Nerves (Trigeminal). Paralysis of the Masseter Muscles." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 402-403.

MACCORMACK, P. "An Interesting Post-mortem." *Vet. News.* Vol. XIII., No. 676. 16th December 1916. P. 521.

An obscure case in a four-year-old bullock in which post-mortem examination revealed a large deep-seated abscess in the liver.

MAHON, F. C. "The Effect of Heat, Burns, and Scalds in the Human Subject and Domesticated Animals." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 391-397.

As burns and scalds produce grave shock the author is in the habit of using pituitrin and adrenalin.

MATHESON, J. A. "An Interesting Shrapnel Injury." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. P. 44.

A shrapnel bullet had lodged in the body of the third cervical vertebra and fractured it into several splinters.

MAYALL, G. "Tuberculosis in a Cart Mare." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 404-406.

PARKER, J. H. "A Long Illness." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 401-402.

— "Snoring in Cattle." *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 15-16.

The snoring was due to an abscess in the throat. This was opened and the symptom ceased.

RIPLEY, J. H. "Imperforate Hymen." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 403-404.

The case occurred in a cross-bred heifer about twenty months of age.

— "The Treatment of Gangrenous Mammitis." *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 11-12.

The writer describes three cases he has treated as follows:—As soon as diagnosis was certain, he made five or six incisions into the mammary glands by means of an abscess knife. The incisions were about 2 ins. deep, but only large enough to admit the nozzle of an enema syringe. The wounds were syringed thrice daily with a solution of hypochlorous acid. Subsequently the punctures were enlarged and joined to form one long incision.

ROBERTS, G. JONES. "Unusual Cases." *Vet. Record.* Vol. XXIX., No. 1495. 3rd March 1917. P. 362.

An account of three cases. One is a case of difficult parturition in a four-year-old Shire mare. The foal was delivered alive, but without a vestige of fore limbs. The scapulae were present. In 1914 the same mare had given birth to twins, both dead, and both with crooked legs. In 1915 she was delivered of a foal affected with hydrocephalus.

The second case is that of a mare, which had lost an eye from the effect of ointment, giving birth to a foal with one eye.

The third case is one of gloss-anthrax.

TAYLOR, H. "Interdigital Melanotic Tumour." *Vet. Record.* Vol. XXIX., No. 1484. 16th December 1916. P. 248.

The case occurred in a black spaniel about three or four years old, in which there were several interdigital abscesses.

WILSON-BARKER, J. "An Unusual Case." *Vet. News.* Vol. XIV., No. 679. 6th January 1917. Pp. 4-5. 1 Figure.

WOODROW, J. S. S. "An Unusual Accident." *Vet. Record.* Vol. XXIX., No. 1492. 10th February 1917. P. 329.

A filly was found to have got the tongue through the ring of an ordinary snaffle mouthing bit.

YATES, G. "Vesicle Calculi in a Cat." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. P. 407.

— "Obscure Lameness in the Dog." *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 16-17.

Two cases apparently of nerve injury.

DIETETICS.

ARMSBY, H. P. "The Use of Energy Values in the Computation of Rations for Farm Animals." *Bull. No. 459.* U. S. Dept. of Agric. 15th December 1916. Pp. 1-29.

The present bulletin is a revision of *Farmers' Bull. No. 346*. The first few pages are devoted to stating briefly the general principles of dietetics. There is an exhaustive list of American food-stuffs, and with each is given its percentage of dry matter, of crude protein, and of true protein, and its net energy value in Therms. The maintenance requirements of horses, cattle, and sheep are stated in Therms of net energy, together with the amount of digestible protein required; also the requirements for growth, milk production, fattening, and for work. The method of compounding rations and how improvement could be effected is fully explained, and the choice of available food-stuffs, with a view to economy, receives the consideration due to its importance.

"Calf-Feeding Experiments. Crushed Oats Compared with Standard Calf Meal." *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVII., No. 2. January 1917. Pp. 257-259.

"Composition, Nutritive and Manurial Value of Farm Foods." *Bull. No. 73.*
Third Revision. University of Leeds Dept. of Agric. 1916.

In tabular form are given the analyses of sixty-four food-stuffs, the amount digestible, the albuminoid ratio, and the starch value of each. Of these food-stuffs there are also stated the manurial ingredients reckoned in lbs. per ton and in percentages, with the estimated value of manure produced from one ton of the food ; the manurial values are reckoned from Hall and Voelcker's tables.

CROWTHER, C. "Palm-Kernel Cake and Meal as Food for Pigs." *Journ. Board of Agric.* Vol. XXIII., No. 9. December 1916. Pp. 850-859.

GILCHRIST, D. A. "Palm-Kernel Cake, Palm-Kernel Meal, and Coco-Nut Cake Compared with Soya Cake for Fattening Cattle, Young Store Cattle, and Fattening Sheep." *Bull. No. 25.* County of Northumberland Agric. Exp. Station, Cockle Park. 1916. Pp. 1-8. 5 Tables.

GIULIANI, R. "Substitutes for Oats in the Food of Horses" (Il succedanei dell'avena nell'alimentazione del cavallo). *La Clinica Vet.* Vol. XL., No. 1. 15th January 1917. Pp. 1-15.

After considering the relative nutritive values of oats, maize, barley, molasses, and molasses pulp, Giuliani concludes that molasses and molasses pulp are the most economical.

— "Sesame Cake as a Food for Milch Cows" (Il pane di sesamo nell'alimentazione delle vacche da latte). *La Clinica Vet.* Vol. XL., No. 1. 15th January 1917. Pp. 16-27.

ROUSSEAU, A. "Experiments on the Value of Certain Foods" (Expériences sur la valeur de certains aliments comparés à l'avoine noire du Centre de bonne qualité, pesant 48 kilogrammes). *Rec. Méd. Vét.* Vol. XCII., No. 22. *Bull. Soc. Centr. Méd. Vét.* 16th November 1916. Pp. 358-363.

WILSON, J. "The Scandinavian Methods of Valuing and Using Feeding-Stuffs." *Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVII., No. 2. January 1917. Pp. 208-217.

— "The Cost of Producing Milk." *Journ. Dept. Agric. and Tech. Instr. Ireland.* Vol. XVII., No. 2. January 1917. Pp. 218-224
6 Diagrams.

GENERAL.

C. R. "Light Horses After the War." I. *Field.* Vol. CXXIX., No. 3343. 20th January 1917. P. 86. II. *Ibid.* No. 3344. 27th January 1917. Pp. 147-148. III. *Ibid.* No. 3345. 3rd February 1917. P. 184. IV. *Ibid.* No. 3347. 17th February 1917. P. 262.

The writer of these notes considers that the idea that machinery will replace horses in almost every direction is a fallacy. He points out that, while motor traffic has increased almost everywhere, so also has the demand for horses, for the population has been increasing all the time, and the demands of the people in such matters as delivery have become more exacting.

Some obvious reasons for the retention of the horse are given. One is, that he is able to pull a heavy weight through deep mud in winter time when motor wheels would be so clogged as to become unworkable. Another is the exceeding hilliness of a very great part of this country. Horses can be used for ploughing and leading produce where the motor is impracticable.

PARKER, T. "The Present and Future Meat Supply and the Question of the Free Importation of Canadian Cattle." 1916. P. 35.

"The Value of the Dog." *Field.* Vol. CXXVIII., No. 3338. 16th December 1916. P. 933.

The writer states that Mrs. Ashton Cross refused £1500 for one of her pedigree Pekingese. "Even a Sealyham terrier has been sold for £800, a remarkable price, considering that there are men still alive who remember when half a sovereign was considered to be a big price." "Twice since trials became so popular the sum of 500 guineas has been paid for a retriever." "Mr. R. Purcell Llewellyn has made history by having refused £750, then £1200, and finally £2000 for his English setter Count Wind 'Em."

HISTORICAL.

CRAWFORD, R. "Legends and Lore of the Genesis of the Healing Art." *Lancet.* Vol. CXCI., No. 4870. 30th December 1916. Pp. 1086-1095.

SMITH, F. "The Early History of Veterinary Literature and its British Development." *Journ. Comp. Path. and Therap.* Vol. XXIX., Part 4. December 1916. Pp. 318-335.

A continuation of Major-General Smith's historical account of veterinary literature. Deals with the works of Gervase Markham, 1568 (?)-1637.

V.-F. D. "History of Glanders" (Contribution à l'histoire de la morve). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 300. December 1916. Pp. 601-608.

HYGIENE AND PREVENTIVE MEDICINE.

GORINI, C. "The Hygienic Production of Milk" (Studi sulla produzione igienica del latte). *La Clinica Vét.* Vol. XL., No. 2. 31st January 1917. Pp. 35-44.

WAY, C., CORBIN, C. I., and FITCH, E. W. "Report of the Committee on Clean Milk." *Cornell Veterinarian.* Vol. VII., No. 1. January 1917. Pp. 5-12.

INFECTIOUS DISEASES.

AUBRY. "Epizootic Lymphangitis" (La lymphangite épizootique dans le région de Meknès). *Rec. Méd. Vét.* Vol. XCII., No. 22. *Bull. Soc. Centr. Méd. Vét.* 9th November 1916. Pp. 337-345.

BACRI. "Treatment of Tetanus by Antitetanic Serum" (Traitement du tétanos confirmé par le sérum antitétanique à doses massives et répétées). *Bull. Acad. Méd.* Vol. LXXVI., No. 42. 21st October 1916. Pp. 316-318.

From results obtained by the treatment of thirteen cases of tetanus in man, Bacri is firmly convinced that antitetanic serum is curative at all stages of the disease, even where a prophylactic injection has not been given. Subcutaneous injection of large doses should be practised every day for six days. The treatment should be begun on the appearance of trismus, and should be followed in spite of the apparent benignity of the disease. The treatment should be exclusive and systematic.

BÉCLÈRE, A. "Variola and Vaccinia in Calves" (Inoculabilité de la variole à la génisse vaccinée, mais non complètement immunisée). *C. R. Acad. Sci.* Vol. CLXIII., No. 22. 27th November 1916. Pp. 676-678.

BELFANTI, S., and ASCOLI, A. "Avian Plague and Foot-and-Mouth Disease" (Spigolature nella peste aviaria e nell' afta). *La Clinica Vét.* Vol. XXIX., No. 12. 15th October 1916. Pp. 577-597. 5 Tables, 2 Charts.

BELIN. "Treatment of Epizootic Lymphangitis by Autopyotherapy" (Traitement de la lymphangite épizootique par l'autopyothérapie). *Rev. Path. Comp.* No. 130. January 1917. Pp. 7-9.

BRINGARD. "A Case of Complicated Glanders" (Relation d'un cas très intéressant d'affection morvo-farcineuse). *Rec. Méd. Vét.* Vol. XCII., No. 21. 15th November 1916. Pp. 618-622.

BURROWS, H. "Modified Tetanus." *Lancet.* Vol. CXCII., No. 4874. 27th January 1917. Pp. 139-142.

Modified or localised tetanus is tetanus modified by the prophylactic injection of antitetanus serum. Three forms have been recognised, namely—(1) Splanchnic tetanus; (2) cephalic tetanus; (3) local tetanus of the limbs (Courtois-suffit and Giroux, *Les formes anormales du tétranos*, 1916). For the description of a case of localised tetanus in the horse, see Belin, this *Review*, Vol. I. p. 10.

CAMUS, L. "Generalised Vaccinia" (De la vaccine généralisée expérimentale. Conditions de sa production). *Bull. Acad. Méd.* Vol. LXXVI., No. 43. 31st October 1916. Pp. 342-344.

— "Generalised Vaccinia in the Dog" (À propos de la vaccine généralisée chez le chien). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 1008-1009.

— "Generalised Vaccinia in the Dog" (Reproduction de la vaccine généralisée chez le chien). *Bull. Acad. Méd.* Vol. LXXVI., No. 45. 14th November 1916. Pp. 376-377.

— "Generalised Vaccinia in the Calf and the Monkey" (La vaccine généralisée expérimentale chez la génisse et chez le singe). *Bull. Acad. Méd.* Vol. LXXVI., No. 47. 28th November 1916. Pp. 433-435.

— "Generalised Vaccinia in the Guinea-Pig" (La vaccine généralisée chez le cobaye). *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1108-1109.

The localisation of eruptions resembles that in the rabbit and monkey.

CARTIER, J. "Treatment of Epizootic Lymphangitis with Iodide of Potassium" (Note sur le traitement de la lymphangite épizootique par l'iodure de potassium). *Rec. Méd. Vét.* Vol. XCII., No. 21. 15th November 1916. Pp. 614-618.

CAZALBOU, L., and MOREI, G. "Lesions of the Nasal Mucous Membrane in Epizootic Lymphangitis" (Au sujet des altérations de la pituitaire dans la lymphangite épizootique). *Rev. Path. Comp.* No. 128. November 1916. Pp. 11-14.

COMINOTTI, L. "Equine Contagious Abortion" (Dell' aborto contagioso delle cavalle). *La Clinica Vét.* Vol. XXXIX., No. 24. 31st December 1916. Pp. 705-716.

COOLEDGE, L. H. "Is *Bact. abortus* (Bang) Pathogenic for Human Beings?" *Journ. Med. Res.* Vol. XXXIV., No. 3. July 1916. Pp. 459-467. 4 Tables.

There is no proof that *Bact. abortus* (Bang) is pathogenic for human beings. It is possible to cause antibodies for *B. abortus* to appear in the blood-serum of adults by feeding a milk which is naturally infected with the organism, and which contains abortion antibodies. This apparently indicates a passive immunity due to the absorption in the large intestine of antibodies present in an infected milk.

DEAN, C. W. "A Case of Actinomycosis Successfully Treated by Vaccine." *Brit. Med. Journ.* No. 2925. 20th January 1917. P. 82.

A case of actinomycosis in the parotid region of a boy of eighteen. A dose of vaccine of 25 million fragments was given as an initial dose. The same dose was repeated once a week for a month. There was complete recovery except for a slight oedema of the cheek.

Potassium iodide had been tried in the first place, but with little or no effect.

"DUNEDIN." "The Diagnosis of Foot-and-Mouth Disease." *Vet. Record.* Vol. XXIX., No. 1488. 13th January 1917. Pp. 289-290.

EICHHORN, A., and POTTER, G. M. "The Present Status of the Abortion Question." *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 3. December 1916. Pp. 295-307.

GREGG, J. "Hospital Observations on the Mule." *Vet. News.* Vol. XIV., No. 684. 10th February 1917. Pp. 57-58.

Contains notes on various diseases. Respecting glanders in the mule, it is stated that acute laryngitis, with a gelatinous adhering discharge, is common in advanced cases. Mallein is very unreliable, even when given hypodermically in double doses. Conjunctival discs have no effect on a glandered mule. The intradermal palpebral test is fairly reliable when a sterile pure mallein is used in small quantity, but by no means infallible. The same may be said of the complement-fixation test. Mallein prepared from *B. mallei* taken from the mule is supposed to be more reliable than the mallein of commerce.

HARDENBERGH, J. B. "Vaccination against Infectious Arthritis of Foals due to *B. abortus equi*." *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 3. December 1916. Pp. 331-349. 3 Tables. 6 Figures.

HERSHBERGER, F. C. "Anthrax in Manchuria." *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. P. 11.

HOBDAY, F. "The Value of the Intradermo Palpebral Method of Malleinisation." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 388-391. 2 Figures.

The advantages of the method are emphasised and the *modus operandi* described. It is claimed that three or four horses can be inoculated easily in one minute.

KINSLEY, A. T. "Tabulated Recommendations for Methods of Control of White Scours (Dysentery neonatorum) in Calves." *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. P. 12.

KNAPP, G. A. "The Control of Tuberculosis, Abortion, and Calf Scours in a Large Dairy Herd." *Cornell Veterinarian.* Vol. VII., No. 1. January 1917. Pp. 1-5.

Good results in the eradication of tuberculosis in a herd are reported as the result of keeping the cows in separate groups and separating the animals as far as possible by partitions which prevent contact between individuals.

To prevent white scour in calves the pregnant cows are washed and scrubbed all over with soap and water daily for ten days before calving.

LUMIÈRE, A., and ASTIER, E. "Tetanus and Frost-Bite" (Tétanos et gelures). *C. R. Acad. Sci.* Vol. CLXIII., No. 23. 4th December 1916. Pp. 719-721.

Statistics seem to show that the bacillus of tetanus has a special affinity for ulcerative wounds produced by cold.

NICOLAS, E. "Epizootic Lymphangitis in France" (La lymphangite épidéziootique en France. Son traitement par la méthode Chatelain et sa prophylaxie). *Rec. Méd. Vét.* Vol. XCII., No. 22. *Bull. Soc. Centr. Méd. Vét.* 9th November 1916. Pp. 334-336.

POINSIGNON and DIGNAC. "Treatment of Tetanus in the Horse" (Sur le traitement du tétanos chez le cheval). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 299. November 1916. Pp. 548-551. 1 Figure.

The case occurred in a seven-year-old Anglo-Norman mare. Subcutaneous injections of serum were given and chloral administered per rectum. The authors attribute recovery largely to the use of slings, and emphasise the value of mechanical support in tetanus. A curious feature of the case was temporary contracture and wasting of the muscles of the left hind limb.

ROY. "Tetanus" (Tétanos). *Bull. Soc. Méd. Vét. Pratique.* Vol. I., No. 2. February 1917. Pp. 45-46.

Reports the cure of a case of mild tetanus by the repeated subcutaneous injection of phenolised oil. It is possible to inject 10 c.c. or more. The case was cured after fifteen days' treatment.

SCHROEDER, E. C., and COTTON, W. E. "Some Facts about Abortion Disease." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 3. December 1916. Pp. 321-330.

— "Practically Significant Facts about Abortion Disease." *Amer. Journ. Vet. Med.* Vol. XII., No. 2. February 1917. Pp. 73-78.

STEEVENSON, E. F. "Bacterial Necrosis in the Horse." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. Pp. 44-47.

TAYLOR, HENRY. "Black Quarter (?) in the Pig." *Vet. Record.* Vol. XXIX., No. 1495. 3rd March 1917. P. 362.

VAILLARD. "The Prevention of Tetanus by Antitoxic Serum" (Au sujet de la prévention du tétonos par le sérum antitoxique). *Bull. Acad. Méd.* Vol. LXXVI., No. 35. 5th September 1916. Pp. 167-173.

Methodical reinjections of serum form one of the best means of preventing tetanus. The fear of anaphylaxis has been exaggerated. In spite of the efficiency of antitoxic serum it is not *always* infallible; but in those cases where tetanus does occur after serum, at least an appreciable benefit has been procured, for very often the disease is more benign.

WURTZ, R., and HUON, E. "Variolisation of Calves Immunised against Vaccinia" (La variolisation des génisses immunisées contre la vaccine). *C. R. Acad. Sci.* Vol. CLXIII., No. 13. 25th September 1916. Pp. 311-312.

MEDICINE.

BARILE, C. "The Commoner Dermatoses of Military Horses" (Sopra talune dermatosi più communi negli equidi militari). *La Clinica Vet.* Vol. XXXIX., No. 19. 15th October 1916. Pp. 598-604. No. 20. 30th October 1916. Pp. 619-628. No. 21. 15th November 1916. Pp. 655-661.

BOND, P. G. "Stringhalt." *Vet. News.* Vol. XIV., No. 688. 10th March 1917. Pp. 99-100.

This paper contains particulars of eight typical cases which have come under the notice of the author. If the horse shows slight stringhalt only, and is not a shiverer, the author considers himself justified in passing the animal.

BRUNET and LAVAL. "The Mallet-Bonnet Apparatus" (Pince à breuvages Mallet-Bonnet). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 300. December 1916. Pp. 608-611. 3 Figures.

A description is given of an instrument by which the lips are kept together while the drench is injected by a syringe introduced at the angle

of the mouth. The size of the instrument can be adapted in accordance with the size of the horse. It is claimed that there is complete occlusion of the mouth, and therefore the rejection of medicine is prevented. The head of the horse is maintained in the normal position, which is most favourable for the administration of a drench. The instrument does away with the need for a twitch.

"CAPTAIN, A. V. C." "Purpura." *Vet. Rec.* Vol. XXIX., No. 1495. March 1917. Pp. 361-362.

The interesting features are the length of time before petechia or ecchymosis became visible, the loss of blood (from the nostrils), and the fact that the right fore remained fine, whereas the other legs became very swollen.

CHÉNIER. "Treatment of Eczema in the Dog" (*Traitemenit de l'eczéma chez le chien*). *Rev. Path. Comp.* No. 130. January 1917. Pp. 4-5.

FAYET. "Canities in the Horse" (*Des neigeures acquises ou de quelques cas de canitie lente chez le cheval*). *Rev. Path. Comp.* No. 125. November 1916. Pp. 36-39. 2 Figures.

FRENCH, A. W. "Peculiar Conditions Affecting Live Stock in Wyoming." *Amer. Journ. Med. Vet.* Vol. XII., No. 1. January 1917. Pp. 8-9.

A short account is given of "brisket disease" of cattle. The disease occurs in one or two of the Rocky Mountain States, and then only in the higher altitudes. There are two or three counties in the State of Wyoming where the disease has been recognised.

FURTHMAIER, J. "Azoturia in Horses and its Treatment with Digalen." *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. P. 9.

"Digalen" is a proprietary preparation with which the writer claims to have had considerable success in the treatment of the disease.

HANCOCK, R. C. G. "War Pica." *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 4-6.

This may be considered as a supplement to the paper by Friez on "Sand Colic," an abstract of which was given in this *Review*, Vol. I. p. 28. In the writer's opinion it cannot be too often reiterated that sand colic is due to pica. He doubts whether the terms complete and incomplete obstruction will bear examination. It appears that colic is evidence of complete obstruction of variable duration. A line of treatment, somewhat different from that adopted by Friez, is suggested.

KRUMBHAAR, E. B. "Spontaneous Diabetes in a Dog." *Journ. Exp. Med.* Vol. XXIV., No. 4. October 1916. Pp. 361-365. 1 Plate.

M'KILLIP, G. B. "Shipping Fever as met with in a Large City Practice." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6. February 1917. Pp. 692-696.

MERCIER, C. "What is a Disease?" *Science Progress.* Vol. XI., No. 42. October 1916. Pp. 228-235. No. 43. January 1917. Pp. 410-422.

MICHEL, P. "Sand Colic" (Quelques considérations pratiques sur les "coliques de sable"). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 18-27. 2 Charts.

MILLER, J. A., and NOBLE, W. C. "The Effects of Exposure to Cold upon Experimental Infection of the Respiratory Tract." *Journ. Exp. Med.* Vol. XXIV., No. 3. September 1916. Pp. 223-232. 3 Tables.

POTTIE, J. DONALDSON. "Pressure as the Cause of Disease and Pressure as an Aid to the Cure of Disease." *Vet. News.* Vol. XIV., No. 688. 10th March 1917. Pp. 97-98.

ROUSSEAU. "Retention of Urine in a Horse" (Note brève sur un cas de rétention d'urine guérie par une injection de 0·2 gramme de cocaïne). *Rec. Méd. Vét.* Vol. XCII., No. 22. *Bull. Soc. Centr. Méd. Vét.* 16th November 1916. Pp. 363-364.

An aged horse suffered from retention of urine. There were dull colicky symptoms. Not wishing to pass a catheter, Rousseau injected 1 gramme of morphia below the anus. There was no effect. Two hours later he injected 0·2 gramme of cocaine, which was followed in twenty minutes by abundant micturition and a complete cure.

STEFFEN, M. R. "Azoturia." *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. P. 1.

TRICKETT, A. "The Veterinarian and Canine Pathology." *Amer. Journ. Vet. Med.* Vol. XII., No. 1. January 1917. Pp. 6-8.

The author points out that the subject of posology in its application to dogs of different sizes, temperament, and racial characters, is an undiscovered realm to many general practitioners. Experience shows that there probably exists a wider range of difference in the proper doses of drugs in dogs than in any other domestic animal.

A warning is given respecting the administration of drugs which stimulate the nervous system. "In some cases a dose of strychnin of $\frac{1}{100}$ th grain will so disturb a sick dog that the outcome of the case is unfavourably influenced thereby. And in other instances the same quantity of strychnin is sufficient to cause manifestation of toxic symptoms, and even death may succeed the administration of this small quantity of strychnin."

URBAIN, G. "Pseudo-epizootic Encephalo-Myelitis of the Horse" (Encéphalomyélite pseudo-épizootique du cheval). *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 557-561.

WILSON, P. "Stricture of the Pylorus in Cattle." *Vet. Journ.* Vol. LXXIII., No. 499. January 1917. Pp. 6-11.

METHODS.

DORSET, M., and HENLEY, R. R. "A Note on the Preparation and Use of Agglutinin from Beans." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6. February 1917. Pp. 699-702.

The authors have recently described a process of separating the red blood-cells from defibrinated pig's blood in order to procure a serum which can be heated to such a temperature as will render it safe in so far as foot-and-mouth infection is concerned (*Journ. Agric. Res.*, 1916, vol. vi. p. 333). The bean extract, prepared according to the method described, has been found to undergo rapid fermentation. The present paper describes a method of preparing the bean extract whereby the liability to fermentation is overcome.

TRIBONDEAU, L. "Preparation of Blood-Films by the 'Scissors Method'" (Étirement du sang sur lames de verre porte-objets par le "procédé des ciseaux"). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 1011-1012.

— "Method of Using Bi-Eosinate" (Sur le mode d'emploi du bi-éosinate). *C. R. Soc. Biol.* Vol. LXXIX., No. 19. 2nd December 1916. Pp. 1022-1024.

OBSTETRICS.

FERGUSON, A. S. "Eversion of the Uterus in a Mare." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. P. 48.

FRASER, H. "Ruptured Uterus in a Cow." *Vet. Record.* Vol. XXIX., No. 1493. 17th February 1917. P. 340.

HOBDAY, F., and PLAYER, J. F. "An Interesting Case of Eversion of the Uterus in a Cow, Accompanied by Milk Fever." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. P. 43.

PEDRAJA, J. S. "Dystocia Due to Malposition of the Umbilical Cord" (Un caso distocia por desituación del cordón umbilical). *Revista Hig. y Sanidad Vet.* Vol. VI, No. 4. July 1916. Pp. 299-300.

The case occurred in a donkey, and was a lumbo-sacral posterior presentation. The umbilical cord did not follow the usual direction but passed backwards between the posterior limbs of the foetus and round the left thigh to be implanted in the inferior-posterior part of the body of the uterus. The cord thus absolutely prevented the passage of the foetus.

SCOTT, W. "The Induction of Premature Labour in the Mare and the Cow." *Vet. Record.* Vol. XXIX., No. 1496. 10th March 1917. Pp. 371-372.

Five cases are described in which labour was induced by direct irritation of the os uteri. The author does not know of a single case having been recorded in the professional journals.

PARASITOLOGY

(Including Entomology and Protozoology).

BERTON. "The 'Open-Air Cure' of Mange" (La gale et la cure d'air). *Rev. Gén. Méd. Vet.* Vol. XXV., No. 299. November 1916. Pp. 531-539.

BIMBI, P. "Equine Piroplasmosis in Sardinia" (La piroplasmosi equina in Sardegna). *Il Moderno Zootiatro.* Vol. V., No. 9. 30th September 1916. Pp. 225-233.

CONREUR, C. "Osseous Cachexia of Equines. Cylicostomiasis" (Cachexie osseuse des équidés. Cachexie vermineuse des équidés. Cylicostomose). *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 600-633.

CROPPER, J. W., and ROW, R. W. H. "A Method of Concentrating Entamoeba Cysts in Stools." *Lancet.* Vol. CXCII., No. 4875. 3rd February 1917. Pp. 179-182. 3 Figures.

Methods of concentrating entamoeba cysts from faeces are described, suitable for diagnosis and cultivation experiments respectively.

DESCAZEUX, J. "‘Esponja’ or ‘Summer Sores’ in Horses in Brazil" (Contribution à l'étude de l’ “Esponja” ou plaies d'été des équidés du Brésil). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 297. 15th September 1916. Pp. 431-433.

“Esponja” or “summer sores” affect the skin of horses in Brazil from October to April. Treatment is of no avail, but the sores heal spontaneously on the approach of winter. Larvae of a species of *Habronema* are found in the sores, and it is suggested that infestation is produced by contact with manure containing the embryos; but flies as carriers are not excluded.

FAYET. “Sarcoptic Mange” (Du diagnostic de la gale sarcoptique équine sur le front). *Rev. Gén. Méd. Vét.* Vol. XXV., No. 299. November 1916. Pp. 539-548.

FROGGATT, W. W. and T. L. “Sheep-Maggot Flies, No. 2.” *Farmers’ Bull.* No. 110. Depart. Agric., New South Wales. August 1916. P. 30. 8 Figures.

HALL, M. C. “A Synoptical Key to the Adult Taeniod Cestodes of the Dog, Cat, and some Related Carnivores.” *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 3. December 1916. Pp. 356-360.

The key is intended to designate the relations and importance of the tapeworms as well as to distinguish them from one another. The key does not cover the species in the family *Diphyllobothriidae*.

— “American Records of *Diocophyllum renale*.” *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 3. December 1916. Pp. 370-371.

Riley has recently compiled the record of American cases of the giant kidney worm in the dog (see this *Review*, Vol. I, p. 86). To these are now added two other records.

KOLMER, J. A., SCHAMBERG, J. F., and RAIZISS, G. D. “Various Methods of Determining the Trypanocidal Activity of Substances *in vitro* and their Relationship to the Chemotherapy of Experimental Trypanosomiasis.” *Journ. Inf. Dis.* Vol. XX., No. 1. January 1917. Pp. 10-27. 15 Tables.

Among the substances tested were arsenobenzol, a derivative of guiacol, an organic compound of copper, copper salicylate, copper sulphate, phenol, bichloride of mercury, and other mercury compounds. Substances exerting a profound trypanocidal activity *in vitro* are likely to prove trypanocidal *in vivo*, provided the drug is sufficiently non-toxic to be administered in adequate dosage. By the methods described in this paper arsenobenzol, or salvarsan, has been shown to possess a high trypanocidal activity *in vitro*. *In vitro* methods have also demonstrated a trypanocidal activity on the part of mercurials which is not apparent in the *in vivo* tests.

MÖLLER, W. "The Transmission of *Trypanosoma theileri*, Laveran, 1902" (Die Uebertragung des *Trypanosoma theileri*, Laveran, 1902). *Berl. tierärztl. Wochenschr.* Vol. XXXII., No. 39. 28th September 1916. Pp. 457-460.

It appears probable that *Trypanosoma theileri* occurs wherever domestic cattle are found, and also among certain wild ruminants, such as antelopes. The trypanosome is harmless and easily bred. There is some doubt respecting its mode of transmission. Theiler held that *Hippobosca rufipes*, Olf., and *H. maculata*, Leach, were the carriers; but Hippoboscids are not common on German cattle, which seems to show that they cannot play a very important part in transmission. Suspicion attaches to Tabanids, as they harbour many flagellates, and the author inclines to the view that Tabanid flagellates are connected with *Trypanosoma theileri*.

RAILLET. "Cestodes of Birds" (Les cestodes des oiseaux. Détermination du parasite). *Rev. Path. Comp.* No. 128. November 1916. Pp. 19-20.

RICHTER, C. "The Control of Mange" (Ein Beitrag zur Räudebekämpfung). *Deutsche tierärztl. Wochenschr.* Vol. XXIV., No. 47. 18th November 1916. Pp. 429-430.

The official treatment of mange in the horses of the German south army consists in shaving the animal and rubbing in a mixture of lime-water and petroleum. Burnt lime, 2 lbs., is gradually slaked with either cold or hot water. Three gallons of water is then added, with constant stirring. After the lime has been allowed to settle, three gallons of the liquid is drawn off and diluted with an equal quantity of water. Six gallons of petroleum is now added. Half the quantity of petroleum, or even less, should be used for animals with sensitive skins. It is best to mix the lime-water and petroleum when required, making the mixture of the strength suitable for each case.

The application must be renewed every third day until cure is complete.

RILEY, W. A. "Another Case of the Occurrence of the Giant Nematode, *Dioctophyme renale*, in the Abdominal Cavity, and Data bearing upon the Theory of Entry via the Genito-Urinary Tract." *Cornell Veterinarian.* Vol. VII., No. 1. January 1917. Pp. 43-45.

The author has recently brought together twenty-seven records of the occurrence of the giant nematode in the United States and Canada (see this *Review*, 1917, Vol. I. p. 86). He now adds another case where two worms, a male and a female, were found in the peritoneal cavity of a female dog which had been in a laboratory for about two years, was very fat and in excellent condition, save for occasional periods of vomiting.

Riley concludes that evidence does not support the theory that the parasites enter through the genito-urinary tract. It seems altogether prob-

able that the larval form is taken into the alimentary canal, from whence it escapes into the body cavity (Balbiani, G., *Journ. Anat. et Phys.*, 1871, vol. vii. p. 180).

SYMONS, S. T. D. "Tick-Bite in Stock and its Treatment." *Agric. Gazette, New South Wales.* Vol. XXVII., No. 11. November 1916. P. 767.

In the coastal regions of Australia young stock suffers from the bite of the scrub tick, *Ixodes holocyclus*, in the early spring and autumn. A staggering gait and paralysis of the hind limbs is produced. The ticks should not be forcibly removed. If a drop of turpentine or kerosene be placed on each they can be picked off on the following day.

TRYON, H. "The Spider or Tick Fly of the Horse" (*Hippobosca equina*, Linné). *Queensland Agric. Journ.* Vol. VI., No. 4. October 1916. Pp. 267-274.

The distribution of *Hippobosca equina*, always very extensive, has recently been recorded from Southern Queensland. Large numbers may infest a single animal without the production of any indications of discomfort; though horses unaccustomed to the fly evince marked irritation when attacked. A study of the life-history indicates that only a single puparium is produced at a time. A month or more may elapse between the deposition of the puparium and the production of an adult. No evidence has been adduced to show that the fly is a disseminator of disease.

URBAIN, G. "Demodectic Mange of the Horse. Contagion to Man" (Un cas de gale démodectique du cheval. Contagion à l'homme). *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 576-578.

A case reported from Brazil where a man infected his face with *Demodex* from a horse in his charge. The contagious character of *Demodex folliculorum* of the dog is held to be not yet proven.

VAN SACEGHEM, R. "The Transmission of *Trypanosoma cazalboui*" (Contribution à l'étude de la transmission du *Trypanosoma cazalboui*). *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 569-573.

Reasons are given for assuming that *Hæmatopota perturbans*, Edwards, is mainly responsible for the transmission of *Trypanosoma cazalboui*, var. *pigritia*, to herds in the Zambi district (Lower Congo). Probably mosquitoes, and even some of the ticks, may also be concerned.

VELU, H., and EYRAUD, R. "Trypanosome Infection by Milk" (Trypanosomiase des chevaux du Maroc. Infestation d'un jeune chien par l'allaitement). *Bull. Soc. Path. Exot.* Vol. IX., No. 8. October 1916. Pp. 567-568.

PATHOLOGY AND BACTERIOLOGY.

BEAUVÉRI, J. "The Influence of Osmotic Pressure on Bacteria" (Nouvelles expériences sur l'influence qu'exerce la pression osmotique sur les bactéries). *C. R. Acad. Soc.* Vol. CLXIII., No. 24. 11th December 1916. Pp. 769-772.

BORDOLI, J. B. "Experiments on the Resistance of *Bacillus anthracis* to the Action of Solutions of Chloride of Sodium" (Experimentos sobre la resistencia del *Bacillus anthracis* á la acción de las soluciones de cloruro sódico). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 10. January 1917. Pp. 747-751.

BRINGARD. "Mycotic Pseudo-Tuberculosis in a South American Horse" (Pseudo-tuberculose mycosique chez un cheval sud-américain). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 33-34.

DAVIS, D. J. "Hemolytic Streptococci Found in Milk." *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 236-252. 4 Tables, 2 Figures.

DOLD, H. "Four Fresh Cases of Bacillary Dysentery in the Dog" (Vier weitere Fälle von natürlich erworbsener bazillärer Dysenterie beim Hunde, nebst Beobachtungen über Bazillen-trägertum). *Deutsche med. Wochenschr.* 6th July 1916. Pp. 811-813.

Dysentery is common among the dogs of Shanghai. Out of seven dogs affected with the disease D. was able to isolate the bacillus of Flexner twice, the Y-bacillus once, and the Shiga-Kruse bacillus once.

EVANS, F. A. "The Reaction of the Spleen in Acute Infections." *Bull. Johns Hopkins Hosp.* Vol. XXVII., No. 310. December 1916. Pp. 356-363. 1 Plate, 3 Figures.

GALLEGOS, A. "Hepatic Cirrhosis in Distomatoses" (Las cirrosis hepáticas en la distomatosis). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 4. July 1916. Pp. 279-289. 6 Figures.

— "Primary Carcinoma of the Pancreas in a Cow" (Carcinoma canalicular del páncreas en la vaca). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 7. October 1916. Pp. 503-522. 13 Figures.

GRIMALDI, E. "Changes in the Adrenals of Domestic Animals in Various Pathological Conditions" (Le alterazioni delle capsule surrenali in rapporto ai diversi stati patologici degli animali domestici). *La Clinica Vet.* Vol. XXXIX., Nos. 22-23. 30th November-15th December 1916. Pp. 671-700.

BIBLIOGRAPHY—PATHOLOGY AND BACTERIOLOGY 201

LAMBERT, R. A., and ALLISON, B. R. "Types of Lesion in Chronic Passive Congestion of the Liver." *Bull. Johns Hopkins Hosp.* Vol. XXVII., No. 310. December 1916. Pp. 350-356. 3 Plates, 7 Figures.

LOPEZ, C. "The Action of Chloride of Sodium and Sea Water on the *Bacillus anthracis*, etc." (Acción del cloruro sódico y del agua de mar sobre el *Bacillus anthracis*, infección carbuncosa, bacilo anthracoide y otras bacterias). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 1. April 1916. Pp. 1-12.

LUMIÈRE, A. "On the Presence of Tetanus Bacilli on the Surface of Projectiles included in Cicatrised Wounds" (Sur la présence du bacille du tétanos à la surface des projectiles inclus dans plaies cicatrisées). *C. R. Acad. Sci.* Vol. CXLIII., No. 15. 9th October 1916. Pp. 378-380.

It is concluded that projectiles included in wounds may carry with them the spores of the tetanus bacillus, which would be a source of danger.

MATHERS, G. "Different Types of Streptococci and their Relation to Bovine Mastitis." *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 222-235. 7 Tables.

MOTTRAM, V. H. "Fatty Infiltration of the Cat's Kidney." *Journ. Physiol.* Vol. L, No. 6. September 1916. Pp. 380-390.

MURRAY, T. J. "A Comparative Study of Colon Bacilli from Horse, Cow, and Man." *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 161-174. 5 Tables, 2 Charts.

On an average, the different types of strains—human, bovine, and equine—exhibit a remarkable similarity in all reactions tested, chiefly in acid-production. One remarkable exception is the ability of strains of bovine colon bacilli to produce acid in inulin media.

PIOT-BEY. "Enormous Arterio-Venous Dilatation in the Tail of an Ox" (Énorme dilatation artério-veineuse coccygienne chez le bœuf). *Rec. Méd. Vet.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 30-32.

The author was called to a case of bleeding from a swelling about 12 cm. from the end of the tail of a six-year ox. The haemorrhage was easily checked. A post-mortem examination became possible later, and it was found that the artery and veins of the tail were enormously dilated in the swelling.

RONCA, V. "Hepatic Aneurism in Distomatosis" (Aneurismi epatici nella cirrosi distomatosa). *La Clinica Vet.* Vol. XXXIX., No. 21. 15th November 1916. Pp. 641-650.

Two cases are described.

202 BIBLIOGRAPHY—PHARMACOLOGY & THERAPEUTICS

TENBROECK, C. "A Non-Gas-producing Strain of the Hog-Cholera Bacillus Isolated from an Old Laboratory Culture." *Journ. Exp. Med.* Vol. XXIV., No. 3. September 1916. Pp. 213-220. 5 Tables.

VELU. "Pathogenic Rôle of a Forage Grass (*Stipa tortilis*) in Morocco" (Rôle pathogène d'une graminée marocaine (*Stipa tortilis*)). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 28-30.

Gives an account of the effect on the skin and deeper tissues of sheep produced by the penetration of the glumes of *Stipa tortilis*. The fruits produce ulceration of the skin and possibly subcutaneous abscesses. It is possible that they may penetrate the chest and cause pleurisy and traumatic pericarditis. They cause inflammation of the feet with abscess formation, necrosis, and arthritis.

WARD, A. R. "Suppuration in Cattle and Swine caused by *Bacterium pyogenes*." *Cornell Veterinarian*. Vol. VII., No. 1. January 1917. Pp. 29-42. 2 Plates.

That such a common pyogenic organism of cattle and swine long escaped recognition in Europe is probably chiefly because it will not grow well on common culture media, such as agar and bouillon. The addition of 10 per cent. of blood-serum to bouillon makes a suitable medium, and the addition of from 20 per cent. to 30 per cent. of serum to melted agar just before pouring the plates makes a suitable medium for isolating *B. pyogenes* in pure culture.

The paper contains an account of the literature on the subject since 1898.

PHARMACOLOGY AND THERAPEUTICS.

COLEMAN, W. "Expectorant Action of Ammonium Chloride." *Amer. Journ. Med. Sci.* Vol. CLII., No. 4. October 1916. Pp. 569-574.

As the result of experiment it is claimed that ammonium chloride is an expectorant within the definition of the term. It probably acts by increasing the water of secretion and softening the mucus.

CONN, C. H. "Apomorphin and Lobelin." *Vet. News.* Vol. XIII., No. 676. 16th December 1916. Pp. 521-522.

DALMIER, R. "The Toxicity of Emetin" (La toxicité du chlorhydrate d'émétin). *La Presse Méd.* Vol. XXV., No. 4. 18th January 1917. Pp. 33-35.

An account of emetin intoxication in man and animals.

BIBLIOGRAPHY—PHARMACOLOGY & THERAPEUTICS 203

DE LA PAZ, D., and GARCIA, F. "An Experimental Study on the Use of Apomorphin to Remove Foreign Bodies from the Respiratory Passages." *Philippine Journ. Sci.* Vol. XI., Sec. B., No. 1. January 1916. Pp. 51-61. 2 Plates, 4 Figures, 1 Text Figure.

Standard text-books on pharmacology refer to the use of apomorphin to remove foreign bodies from the respiratory passages. It is said that coincidentally with the act of vomiting, violent movements of expiration are produced which expel or at least facilitate the expulsion of the foreign body.

As the result of experimentation on dogs the authors of this paper conclude that the administration of apomorphin cannot facilitate the removal of foreign bodies from the trachea, because the glottis remains closed during the act of vomiting, and no expiration occurs during the act. Moreover, a strong expiratory effort is not produced immediately after the expulsion of the vomitus.

HILL, J. R. "Formaldehyde and Potassium Permanganate Fumigant." *Pharmaceutical Journ.* Vol. XCVII., No. 2775. 23rd December 1916. Pp. 589-590.

The present price of potassium permanganate precludes its use along with formaldehyde as a fumigant. Adding a solution of formaldehyde to quicklime is more economical.

HOSKING, A. "Notes on Medicinal Plants." *Bull. No. 78.* West of Scot. Agric. Coll. 1917. Pp. 103-149.

The principal reasons for issuing this Bulletin are:—(1) To discuss the possibilities and limitations of the cultivation and collection from wild sources of medicinal plants in Scotland. (2) To supply information on herb-growing to the general public. (3) To present in handy form a list of the principal hardy plants used in the practice of medicine and by herbalists. (4) To give some important particulars about the plants themselves. An extensive list, with valuable details, is given of hardy herbs, trees, and shrubs used in medicine, as well as a table of the common and botanical names of medicinal plants.

KURODA, M. "Observations of the Effects of Drugs on the Ileo-Colic Sphincter." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 3. December 1916. Pp. 187-195. 9 Figures.

The author examined the action of atropin, pilocarpin, nicotin, and cocaine on the ileo-colic sphincter of the cat.

LAMSON, P. D. "The Rôle of the Liver in Acute Polycythaemia. IV. Further Observations on the Effect of Shutting Off the Arterial Blood-Supply to the Liver, the Reaction of the Normal Animal to Epinephrin, and Removal of the Liver from the Circulation." *Journ.*

204 BIBLIOGRAPHY—PHARMACOLOGY & THERAPEUTICS

Pharmacol. and Exp. Therap. Vol. IX., No. 3. December 1916.
Pp. 129-154. 7 Figures.

"Further observations on the effect of the intravenous injection of epinephrin in varying doses in cats and dogs are here recorded. These experiments are offered as further evidence that the liver is the organ in which the processes take place, by which the number of erythrocytes per unit volume of blood is increased in acute epinephrin polycythaemia."

MACHT, D. I. "Action of Opium Alkaloids on the Ducts of the Testis." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 2. November 1916.
Pp. 121-127. 5 Figures.

— "On the Pharmacology of the Ureter. III. Action of the Opium Alkaloids." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 3. December 1916. Pp. 197-216. 30 Figures.

Reports the effect of some of the opium alkaloids, individually and in combination, on the ureter of the pig.

PELLINI, E. J., and WALLACE, G. B. "The Pharmacology of Emetin." *Amer. Journ. Med. Sci.* Vol. CLII., No. 3. September 1916. Pp. 325-336. 4 Figures.

From experiments on dogs, cats, and other animals the following conclusions have been reached:—(1) Emetin depresses and may finally paralyse the heart. (2) It is a powerful gastro-intestinal irritant whether given by mouth or subcutaneous injection. (3) It causes a definite derangement of metabolism, characterised by an increase in nitrogen loss and an acidosis. (4) While in normal individuals given moderate doses these actions may not be of importance, in pathological states of the circulation, intestinal tract, or metabolism, they may be a very definite source of danger.

SMITH, M. I., and HATCHER, R. A. "A Contribution to the Pharmacology of Stovain." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 4. January 1917. Pp. 231-240. 1 Figure.

WADDELL, J. A. "The Pharmacology of the Uterus Masculinus." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 3. December 1916.
Pp. 171-178. 7 Figures.

The uterus masculinus reacts to drugs in general, essentially like the uterus of the female.

— "The Pharmacology of the Prostate." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 3. December 1916. Pp. 179-186. 7 Figures.

Herein is described the action of epinephrin, barium chloride, pilocarpin, arecolin, atropin, and nicotin on the prostate of pigs, cats, rabbits, guinea-pigs, and rats.

PHYSIOLOGY.

CERVERA, L. "Contribution to the Study of the Pancreatic Secretion" (*Contribución al estudio de la secreción pancreática*). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 11. February 1917. Pp. 821-824.

GOODMAN, C. "The Transplantation of the Thyroid Gland in Dogs." *Amer. Journ. Med. Sci.* Vol. CLII., No. 3. September 1916. Pp. 348-355. 4 Figures.

The author agrees with Stich, Borst, Enderlen, Carrel, Lexer, and Jeger that auto-transplantation is practicable. "After homo-transplantation the transplant of a blood-vessel will retain its life for an indefinite length of time, while more highly organised tissue of a more complicated physiological function will remain intact for a short time only, from two to four weeks, and will then show evidences of absorption. In the absence of haemolysis and agglutination the life of the transplant of even more highly organised tissue may be prolonged. We must conclude that up to the present time we have no means of prolonging the life of an organ transplanted from one animal to another indefinitely."

HALDANE, J. S., and PRIESTLEY, J. G. "The Regulation of Excretion of Water by the Kidneys." *Journ. Physiol.* Vol. L., No. 5. July 1916. Pp. 296-311.

The diuresis caused by drinking water is not dependent on general dilution of the blood with liquid. Drinking salt solution causes lowering of the haemoglobin percentage. The diminished excretion of urine following great sweating is not dependent on general concentration of the blood, although some general concentration may occur.

KOCHER, R. A. "The Effect of Activity on the Histological Structure of Nerve Cells." *Journ. Comp. Neurol.* Vol. XXVI., No. 3. June 1916. P. 356.

Extensive observations on dogs, cats, rats, pigeons, sparrows, and frogs revealed no real differences between fatigued and resting nerve cells.

KOJIMA, M. "Preliminary Communication on the Effects of Thyroid Feeding upon the Pancreas." *Proc. Roy. Soc. Edin.* Vol. XXXVI., Parts III. and IV. 1915-1916. Pp. 240-242. 2 Plates.

Thyroid feeding produces morphogenetic changes of two kinds in the pancreas. One is the division and multiplication of the gland-cells. After a few days' feeding, also, the relative amount of zymogen in the gland-cells is considerably diminished. This continues, if the feeding be continued, for about three weeks, after which the granules again accumulate.

LANGLEY, J. N. "Observations on Denervated Muscle." *Journ. Physiol.* Vol. L., No. 5. July 1916. Pp. 335-344.

The atrophy occurring in a muscle separated from its nerve is not a disuse atrophy in the ordinary sense of the term, i.e. it is not due to absence of contraction.

MENDEL, L. B. "Abnormalities of Growth." *Amer. Journ. Med. Sci.* Vol. CLIII., No. 1. January 1917. Pp. 1-20. 20 Figures.

ROBINSON, G. C. "The Influence of the Vagus Nerve upon Conduction between Auricles and Ventricles in the Dog during Auricular Fibrillation." *Journ. Exp. Med.* Vol. XXIV., No. 5. November 1916. Pp. 605-619. 1 Plate, 2 Figures.

SLEMONS, J. M., and MORRISS, W. H. "The Non-Protein Nitrogen and Urea in the Maternal and the Foetal Blood at the Time of Birth." *Bull. Johns Hopkins Hosp.* Vol. XXVII., No. 310. December 1916. Pp. 343-350.

The same concentration of urea in the maternal and foetal circulation indicates that this substance passes through the placenta by diffusion. Complications accompanied by an increase of urea in the maternal blood are also attended with a corresponding increase in the foetal blood urea. Pathological cases thus confirm the conclusion that urea diffuses through the placenta.

TANBERG, A. "The Relation between the Thyroid and Parathyroid Glands." *Journ. Exp. Med.* Vol. XXIV., No. 5. November 1916. Pp. 547-559. 1 Plate, 6 Figures.

The parathyroid and thyroid are independent organs, each having specific functions. No proof of the existence of a vicarious co-operation between the two glands has been established.

YANAGAWA, H. "On the Secretion of Lymph." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 2. November 1916. Pp. 75-105.

POULTRY DISEASES.

DICKSON, E. C. "Botulism, a Cause of Limber Neck in Chickens." *Journ. Amer. Vet. Med. Assoc.* Vol. I., No. 3. January 1917. Pp. 612-613.

GALLAGHER, F. "Epithelioma Contagiosum of the Quail." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 3. December 1916. Pp. 366-369.

Epithelioma contagiosum avium is one of the most common and destructive

diseases of fowls, but the writer has failed to find a record of its occurrence in the quail. Four hundred quails were under observation, and the mortality during a period of five weeks was 85 per cent.

SHEPPARD, F. "Prevention of Poultry Diseases." *Rhodesia Agric. Journ.* Vol. XIII., No. 6. December 1916. Pp. 836-844.

SEROLOGY AND IMMUNOLOGY.

BARILE, G. "On the Value of the Polyvalent Antipyrogenic Serum of Lanfranchi-Finzi" (Sul valore del siero antipiogene polivalente Lanfranchi-Finzi). *Il Nuova Ercolani.* 31st October-10th November 1916.

Two observations of cure by the use of the serum in a case of traumatic arthritis and an adenitis. The writer also points out the advantage of the serum in pustular dermatitis.

BELIN. "Autopyotherapy" (Autopyothérapie). *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1093-1095.

— (L'autopyothérapie en médecine vétérinaire). *Rec. Méd. Vét.* Vol. XCII., No. 22. 30th November 1916. *Bull. Soc. Centr. Méd. Vét.* 9th November 1916. Pp. 346-350.

— "Reversible Precipitation Obtained by Heating the Serum of Horses Affected with Glanders" (Précipitation reversible obtenue par chauffage du sérum de chevaux attaints de morve). *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1095-1098. *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 21st December 1916. Pp. 405-410.

The sera of certain subjects showed, when heated, a precipitate which was persistent through a definite range of temperature, and when cooled a temporary reappearance of that precipitate.

The precipitate, an albumin, was thermolabile and insensitive to oxidation. It could be demonstrated in serum not collected aseptically.

The results obtained from fourteen army horses pointed to a positive reversible precipitate reaction as agreeing with a very grave prognosis. The diagnostic value of the reaction is very small, but as an aid to prognosis appears to have, in the author's opinion, a certain interest.

BEVAN, L. E. W. "Immunity in its Relation to the Stock Diseases of Southern Rhodesia." *Rhodesia Agric. Journ.* Vol. XIII., No. 6. December 1916. Pp. 800-812. 2 Plates.

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CHIMERA, G. "The Antibodies of Spores" (Gli anticorpi delle spore). *La Clinica Vet.* 30th August 1916. P. 479.

In 1902 Defalle believed that, in the formation of antibodies, spores behave differently from the corresponding organisms. Chimera has conducted investigations of *B. subtilis* and the potato bacillus, and his work seems to show that spores do not produce specific agglutinins for at least ten days after the first inoculation. Agglutinins produced by bacilli have no action on spores.

DANYSZ, J. "Anaphylaxis" (Les causes de l'anaphylaxie; nature et formation des anticorps). *C. R. Acad. Sci.* Vol. CLXIII., No. 26. 26th December 1916. Pp. 985-989.

EICHHORN, A., BERG, W. N., and KELSER, R. A. "Immunity Studies on Anthrax Serum." *Journ. Agric. Res.* Vol. VIII., No. 2. 8th January 1917. Pp. 37-56. 6 Tables, 1 Figure.

GALLAGHER, B. "Fowl Cholera and other Hæmorrhagic Septicæmia Immunisation Experiments." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6. February 1917. Pp. 708-728. 13 Tables.

No noticeable resistance is conferred to fowls by the use of killed fowl cholera bacilli. One strain of live bacilli conferred a marked resistance to a highly virulent strain of the fowl cholera bacillus. The immunity was not absolute, since dilutions of 0·01 c.c. to 1 c.c. of a virulent culture was usually fatal in fowls, rabbits, and guinea-pigs. The same strain of fowl cholera also conferred a fair degree of immunity to rabbits against certain strains of *B. boviseppticus* and complete immunity to a virulent strain of *B. suiseppticus*.

HESS, A. F. "The Separation of Serum into Coagulative and Non-Coagulative Fractions." *Journ. Exp. Med.* Vol. XXIV., No. 6. December 1916. Pp. 701-708. 6 Tables.

HURWITZ, S. H., and MEYER, K. F. "Studies on Blood Proteins. I. The Serum Globulins in Bacterial Infection and Immunity." *Journ. Exp. Med.* Vol. XXIV., No. 5. November 1916. Pp. 515-546. 8 Tables, 7 Text-Figures.

"The process of immunisation is in almost all instances associated with definite increase in the globulins of the blood, and in some cases with a complete inversion of the normal albumin-globulin ratio."

MACCONKEY, A. I. "Note on the Keeping Qualities of Therapeutic Serums." *Brit. Med. Journ.* No. 2923. 6th January 1917. Pp. 10-11. 1 Table.

In regard to diphtheria antitoxin and tetanus antitoxin the loss which occurs on keeping is in the number of units only. The quality of the anti-

toxin remains the same, but the *quantity* is less. This decrease can easily be remedied by giving larger doses.

MACCONKEY, A. I., and HOMER, ANNIE. "On the Passive Immunity Conferred by a Prophylactic Dose of Antitetanic Serum." *Lancet*. Vol. CXCII., No. 4877. 17th February 1917. Pp. 259-261. 8 Tables.

SCOTT, W. "Vaccine Therapy in General Practice." No. I. "Active Immunisation against Pink-Eye." *Vet. News*. Vol. XIV., No. 680. 13th January 1917. Pp. 13-14. No. II. "A Punctured Wound." *Ibid.* No. 681. 20th January 1917. Pp. 22-23. No. III. "Poll Evil." *Ibid.* No. 683. 3rd February 1917. P. 44. No. IV. "Septic Cellulitis in an In-Foal Mare." *Ibid.* No. 684. 10th February 1917. Pp. 56-57.

TURRO, R. "The Defensive Ferments in Natural and Acquired Immunity" (Los fermentos defensivos en la inmunidad natural y adquirida). *Revista Hig. y Sanidad Vet.* Vol. VI., Nos. 5-6. August-September 1916. Pp. 379-395. No. 7. October 1916. Pp. 523-542. Nos. 8-9. November-December 1916. Pp. 607-656.

An exhaustive historical account of immunity.

WARD, S. "The Phenomena of Anaphylaxis." *Lancet*. Vol. CXCII., No. 4873. 20th January 1917. Pp. 105-109.

A general survey of the phenomena and theories of anaphylaxis, with clinical considerations as applicable to man. "In spite of the fact that man is less susceptible to anaphylaxis than some other animals, the danger of this condition is not one to be treated lightly in administering sera prophylactically or therapeutically."

SURGERY.

ANDERSON, LOUISA G., and CHAMBERS, HELEN. "The Treatment of Septic Wounds with Bismuth-Iodoform-Paraffin Paste." *Lancet*. Vol. CXCII., No. 4879. 3rd March 1917. Pp. 331-333. 1 Table.

BEMIS, H. E. "Fistula of the Withers." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 4. 15th December 1916. Pp. 421-423.

BISSAUZE, R. "'Rice-Grain' Cysts" (Les kystes à grain riziformes). *Rev. Path. Comp.* No. 129. December 1916. Pp. 22-24.

BOND, C. J. "The Influence of Antiseptics on the Activities of Leucocytes and on the Healing of Wounds." *Brit. Med. Journ.* No. 2921. 23rd December 1916. Pp. 861-864. 8 Figures. *Ibid.* No. 2927. 3rd February 1917. Pp. 145-148. 6 Figures.

BROWNING, C. H., GULBRANSEN, R., KENNAWAY, E. L., and THORNTON, L. H. D. "Flavine and Brilliant Green. Powerful Antiseptics with Low Toxicity to the Tissues." *Brit. Med. Journ.* No. 2925. 20th January 1917. Pp. 73-78.

CAMPBELL, W. A. "Amputation of Penis : Castration." *Vet. Record.* Vol. XXIX., No. 1490. 27th January 1917. Pp. 310-311.

Three cases of amputation of the penis in horses are described : two on account of warty growths, and one because of paralysis.

CHAMBERS, F. "Fracture of the Pedal Bone: Operation: Recovery." *Vet. Record.* Vol. XXIX., No. 1493. 17th February 1917. P. 339.

The wheel of a motor lorry ran over the outside of the foot of an army charger. There was pus formation. The joint was not implicated. Hot eusol foot-baths were employed.

CHARMOY. "Urethro-Cutaneous Suture in Amputation of the Penis" (La suture uréto-cutanée dans l'amputation chez du pénis le cheval). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 16-18. 2 Figures.

COQUOT, A. "Ventriculectomy and Resection of the Middle Portion of the Vocal Cord" (Corde vocale et ventricule de la glotte. Ventriculectomie et résection de la portion moyenne de la corde vocale. Tubage laryngo-trachéal immédiate). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 6-15. 4 Figures.

DISTASO, A., and BOWEN, T. R. "Auto-Disinfection of Wounds by the Use of Ether Solution." *Brit. Med. Journ.* No. 2930. 24th February 1917. Pp. 259-261.

DUBARD. "Disinfection of the Hands by the Earthy Hypochlorites" (Procédé de désinfection des mains par les "hypochlorites terreux (magnésie et chaux)"). *Bull. Acad. Méd.* Vol. LXXVI., No. 38. 26th September 1916. Pp. 223-226.

DUROUX, E., and COUVREUR, A. "Experimental Section and Regeneration of Nerves" (Contribution expérimentale à l'étude des sections et restaurations nerveuses). *La Presse Méd.* No. 69. 14th December 1916. Pp. 572-574.

FELDMAN, I., and WALTON, A. J. "The Antiseptic Treatment of Wounds." *Lancet.* Vol. CXCI., No. 4869. 23rd December 1916. Pp. 1043-1049. 2 Tables.

The authors recommend the use of carbolic and camphor dressings in all cases of sepsis. The antiseptic is prepared by rubbing together in a mortar

equal parts by weight of pure carbolic acid and camphor. It is primarily essential to provide adequate drainage.

FRASER, J., and BATES, H. J. "The Surgical and Antiseptic Values of Hypochlorous Acid (Eusol)." *Journ. R.A.M.C.* Vol. XXVII., No. 1. July 1916. Pp. 78-84. 1 Plate.

The authors conclude that eusol (a solution containing 0·5 per cent. hypochlorous acid) rapidly and completely stops the progress of infection. So far as concerns war-wounds in general they consider it to be an ideal antiseptic. They have also used the solution intravenously in acute toxæmia accompanying wounds infected by putrefactive organisms.

FROST, J. N. "Intussusception of Small Intestine of a Cow." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6. February 1917. Pp. 729-731.

Intussusception was diagnosed by rectal examination. An incision was made through the wall of the abdomen on the right side of the body. Three feet of intussuscepted intestine was removed, and an end-to-end anastomosis effected as follows:—The mesentery was cut away from the diseased part of the intestine, the blood-vessels were ligatured, and the piece of intestine removed. The cut ends of the intestine were then sutured with two rows of intestinal sutures, bringing the serous coats together, and the mesentery was folded and sutured to the intestine. During the operation the intestine was frequently washed with normal salt solution. The skin and muscle wounds were closed with a single row of sutures. The animal made a good recovery.

FROUIN, A. "The Suture of Nerves" (Sur la suture des nerfs. Note préliminaire). *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1140-1142.

HAMOIR, J. "The Treatment of 'Quittor'" (Le traitement de la nécrose du fibro-cartilage latéral (javart cartilagineux). Étude critique et clinique). *Rev. Gén. Med. Vét.* Vol. XXVI. No. 301. January 1917. Pp. 2-24. 8 Figures.

HOARE, E. WALLIS. "Cystic Disease of the Air-Sinuses." *Vet. News.* Vol. XIII., No. 677. 23rd December 1916. Pp. 532-533.

The suggestion is made that a large trephine should be used and that the opening in the frontal sinus should be as low as possible. Curetting the diseased mucous membrane is considered essential.

HULL, A. J. "The Treatment of Burns by Paraffin." *Brit. Med. Journ.* No. 2924. 13th January 1917. Pp. 37-38.

JONES, R. "Quittor." *Vet. News.* Vol. XIV., No. 682. 27th January 1917. Pp. 32-34.

Contains an account of three cases of "quittor" in which the cause of the diseased condition was different in each case. The cases were subjected to operation.

LACROIX, J. V. "Traumatic Division of the Deep Flexor Tendon Below the Insertion of the Superficial Digital Flexor." *Vet. Journ.* Vol. LXXXIII., No. 499. January 1917. Pp. 12-15.

— "Pitfalls in the Williams' Operation for Poll Evil." *Amer. Journ. Vet. Med.* Vol. XII., No. 2. February 1917. Pp. 84-86.

LAMBERT, R. A. "The Comparative Resistance of Bacteria and Human Tissue Cells to Certain Common Antiseptics." *Journ. Exp. Med.* Vol. XXIV., No. 6. December 1916. Pp. 683-688. 1 Table.

LIGAT, D. "Flavine and Brilliant Green in the Treatment of Infected Wounds." *Brit. Med. Journ.* No. 2925. 20th January 1917. Pp. 78-79.

LOCHELONGUE and DUBARD. "The Bactericidal Action of the Earthy Hypochlorites" (Recherches bactériologiques sur l'action des hypochlorites terreux appliqués à la désinfection des mains). *Bull. Acad. Méd.* Vol. LXXVI., No. 43. 31st October 1916. Pp. 334-337.

MACAULIFFE, L. "Tetrachloride of Carbon as a Cleanser of the Periphery of Wounds" (Dégraissage de la périphérie des plaies de guerre, par le tétrachlorure de carbone). *Bull. Acad. Méd.* Vol. LXXVI., No. 35. 5th September 1916. P. 180.

Tetrachloride of carbon (CCl_4) is obtained by the action of chlorine on carbon bisulphide in the presence of chloride of antimony. It is neutral and stable under ordinary conditions, and is therefore easily kept without alteration. It is less volatile than ether, and a little less so than chloroform, and has not the high inflammability of ether. MacAuliffe suggests its use for the cleansing of wounds.

MARQUIS, E. "Alcohol as a Disinfectant for the Hands" (La justification de l'emploi de l'alcool dans la désinfection du mains). *La Presse Méd.* Vol. XXV., No. 3. 11th January 1917. Pp. 28-29.

Alcohol is practically the best disinfectant for the hands of the surgeon.

MAYALL, G. "Punctured Wound of the Hock in a Cart Mare." *Vet. Journ.* Vol. LXXXIII., No. 2. February 1917. Pp. 65-66.

In open joints and punctured wounds of joints the author recommends the injection of Lugol's solution 1 part and glycerin 4 parts.

NAGEOTTE, J., and GUYON, L. "Neoplasm of Peripheral Neuroglia Grafted and not Re-Innervated" (*Aptitudes néoplastiques de la névrogie périphérique greffée et non réinnervée; conséquences au point de vue chirurgicale*). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 984-991. 5 Figures.

REGNAULT, J. "Surgical Anæsthesia" (*À propos de l'anesthésie chirurgicale*). *Rer. Path. Comp.* No. 130. January 1917. Pp. 13-14.

The experience of the writer of this note goes to show that in man a 1 per cent. solution of stovain is necessary to produce satisfactory local anæsthesia. A 0·5 per cent. solution, without adrenalin, is often insufficient, and though this strength with the addition of adrenalin is a little better, it is not perfect.

RETTERER, E., and VORONOFF, S. "Regeneration of the Resected End of a Long Bone of the Dog and Production of a New Joint" (*Regénération, sur un chien, de l'extrémité réséquée d'un os long et production d'une néarthrose*). *C. R. Soc. Biol.* Vol. LXXIX., No. 19. 2nd December 1916. Pp. 1042-1045.

Eight centimetres of the shaft and the head of the humerus were removed. In little more than a year a part of the bone had regenerated and a new joint formed.

ROWE, L. W. "Trichlor-tertiarybutyl Alcohol Anæsthesia." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 2. November 1916. Pp. 107-116.

Trichlor-tertiarybutyl alcohol ("chloreton") is useful as an anæsthetic in animal experimentation. A dose of 0·4 gramme per kilogramme body weight injected into the peritoneal cavity of the dog produces complete and rapid anæsthesia which lasts for from twelve to forty-eight hours. If recovery of the animal is desired, morphin narcosis should be first produced and followed by one-half of the above dose of the drug.

SMYTHE, R. H. "Quittor." *Vet. News.* Vol. XIV., No. 685. 17th February 1917. Pp. 67-68. 1 Figure.

The author has come to the conclusion that removal of the lateral cartilage after excavating the wall and lifting the coronary band is rarely a success from a surgical or commercial point of view. Apart from the length of time required for the repair of the hoof, there is marked disposition to abscess and sinus formation.

TAYLOR, K. "Specificity in Antiseptics." *Lancet.* Vol. CXCII., No 4878. 24th February 1917. Pp. 294-297. 4 Tables.

TERATOLOGY.

FRÉGER. "Congenital Mammary Fistulæ in the Cow" (Note sur les fistules mammaires congénitales chez la vache). *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 27-28. 2 Figures.

RETTERER, É., and NEUVILLE, H. "Adhesion of the Glans to the Prepuce in the Ox" (Adhérence, chez le bœuf, du gland au prépuce ou fourreau). *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1110-1113.

This must be regarded as due to the persistence of the embryonic condition, and may be influenced by the absence of testicles.

VENTURI, P. "A Case of Bilateral Biglandular Hermaphroditism in a Calf" (Studio anatomo-istologico ed embriologico di un caso di un *Hermaphroditismus biglandularis bilateralis* in un bovino). *La Clinica Vet.* Vol. XXXIX., No. 18. 30th September 1916. Pp. 543-557. No. 20. 30th October 1916. Pp. 607-616. 2 Plates, 6 Figures.

TOXICOLOGY.

HADWEN, S. "So-called Staggers in Horses by the Ingestion of *Pteris aquilina*, the Common Bracken." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6. February 1917. Pp. 702-704.

MAHON, F. C. "A Study in Toxicology: Poisonous Vegetable Agents." *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. Pp. 50-65.

A general paper divided into the following heads:—Poisons encountered mostly in country practice; diseases; leguminosæ; botanical notes; poisoning produced by potatoes; fodder poisoning; therapeutics.

PAMMEL, L. H. "Mouldy Silage." *Amer. Journ. Vet. Med.* Vol. XII., No. 2. February 1917. Pp. 99-100.

PARENT, R. "Loco-Horse" (Loco-Horse). *Rev. Path. Comp.* No. 129. December 1916. Pp. 25-27.

YATES, G. "Cyanide of Potassium Poisoning." *Vet. Journ.* Vol. LXXII., No. 498. December 1916. Pp. 406-407.

A fatal case in a terrier.

TUBERCULOSIS.

BESSAU, G. "Local Sensibility to Tuberculin" (Ueber die Hervorrufung der lokalen Tuberkulinempfindlichkeit). *Berl. klin. Wochenschr.* 17th July 1916. Pp. 801-806.

BIERRY, H. "The Tubercl Bacillus in Sputum and Various Organic Fluids" (Sur la recherche des bacilles tuberculeux dans les expectorations et les divers liquides de l'organisme et sur la recherche des fibres élastiques). *C. R. Acad. Sci.* Vol. CLXIII., No. 21. 20th November 1916. Pp. 618-621.

EICHHORN, A., and BLUMBERG, A. "Diagnosis of Tuberculosis by Complement Fixation, with Special Reference to Bovine Tuberculosis." *Journ. Agric. Res.* Vol. VIII., No. 1. 2nd January 1917. Pp. 1-20. 10 Tables, 1 Figure.

GIRAUD, M., and DUMONT, M. "Tubercl Bacilli in Expectoration Liquefied with Pyridin" (Recherche des bacilles tuberculeux dans les expectorats fluidifiés par la pyridin). *C. R. Soc. Biol.* Vol. LXXIX., No. 18. 18th November 1916. Pp. 976-977.

GRIFFITH, A. STANLEY. "Types of Tubercl Bacilli in Cervical and Axillary Gland Tuberculosis." *Lancet.* Vol. CXCII., No. 4876. 10th February 1917. Pp. 216-218. 4 Tables.

Statistics "show that in childhood cervical gland tuberculosis is caused more frequently by the bovine than by the human type of tubercle bacillus, nearly three-quarters (72·1 per cent.) of the cases in children under ten years of age having yielded bovine tubercle bacilli. In persons over ten years of age infection of human origin is more common, bovine infection accounting for about a third of the cases in the ten to twenty years age-period and for rather less than a fifth of the cases in persons over twenty years of age."

KRAUSE, A. K. "Studies in Immunity to Tuberculosis." (1) Experimental Studies on the Cutaneous Reaction of Tuberculo-Protein. Factors Governing the Reaction. *Journ. Med. Res.* Vol. XXXV., September 1916. Pp. 1-24. (2) The Anaphylactic State in its Relation to Resistance to Tuberculosis Infection and Tuberculous Disease. An Experimental Study. *Ibid.* Pp. 25-42. (3) Concerning the General Tuberculin Reaction. *Ibid.* P. 43.

LHOSTE. "The War against Bovine Tuberculosis" (La lutte contre la tuberculose bovine). *Rev. Path. Comp.* No. 129. December 1916. Pp. 18-22.

RAVETLLAT, J. "The New Bacteriology of Tuberculosis and some Unpublished Notes of Experiments" (Estado actual de la nueva bacteriología de la tuberculosis y algunas notas inéditas de pasados experimentos). *Revista Hig. y Sanidad. Vet.* Vol. VI., Nos. 5-6. August-September 1916. Pp. 357-378.

SOPARKAR, M. B. "The Cultivation of the Tubercle Bacillus Directly from Sputum and Post-Mortem Material." *Indian Journ. Med. Res.* Vol. IV., No. 1. July 1916. Pp. 28-40.

UDALL, D. H., and BIRCH, R. R. "A Further Report of the Diagnosis of Open Cases of Tuberculosis." *Cornell Veterinarian.* Vol. VII., No. 1. January 1917. Pp. 13-29.

WILSON, U. F., and DIETERLE, R. R. "Bacillemia in Tuberculosis as shown by the Examination of Post-Mortem Clots from the Heart" (U. F. Wilson). *Journ. Inf. Dis.* Vol. XIX., No. 2. August 1916. Pp. 260-262. "Tubercle Bacilli in the Heart Clots in Acute Miliary Tuberculosis" (R. R. Dieterle). *Ibid.* Pp. 263-266.

Although tubercle bacilli may be found in the blood, their number scarcely offers diagnostic help.

VETERINARY REVIEW.

CUI BONO?

"Away with your fool Notions; there are too many Bees in your Bonet-case. We will anticipate ourselves with such Measures as our Fathers have followed hitherto."

"What is the good of all your Chemistry," said the old lady, "if it cannot take the stain out of my silk dress."

MANY hard things have been said of late respecting the "neglect of science" by the State and the general public. It is apparently assumed that the legislative rulers of the country are such a cultured body of men that they ought to know the value of pure science as leading to applied science, and act in accordance with their knowledge, giving that encouragement and material assistance to pure science which the interests of national prosperity seems to dictate. Let us assume that the legislature consists of men to whom the history of scientific advance is known to the last letter. Is it also right to assume that this is sufficient to secure such legislative measures as the scientist deems imperative? As a plain, uninstructed man, I cannot help feeling that the governing class will move in this matter as they have done in others, and at the same kind of time. We all recognise that the State waits on public opinion. When public opinion has been sufficiently educated, the State is compelled to move. Consequently, it appears to me—as a plain, uninstructed man—that the scientist should make it his business to let the general public know how much the phases and functions of daily life depend upon discoveries of pure science. The man in the street may have a psychology which *appears* strange; but in reality the psychic processes of the community as a whole are quite consonant with well-

recognised laws. The sociologist will tell us that the average man, as a member of the community, has no affection for anything which disturbs the even trend of his mental processes. And the average man has not been in the habit of seeking for hidden causes. He takes things as they come, because inquiry into causes and the study of historic development would mean moving aside from his fellows. All the same, if the facts are dinned into him with sufficient persistence and insistence, and especially if they are made easy of assimilation, they ultimately cease to be strange, and are consequently incorporated into his general mental furniture. If it were possible to get the average member of the general public to realise that all the contraptions which make his daily business possible are based upon a long series of research and inquiry which has come to be known, unfortunately, as pure science, he would realise that the science hidden from him is of vital moment because it makes possible that applied science with which he is so familiar that he does not recognise it as science at all.

To me it seems unreasonable to inveigh against the apathy of the public when the public cannot possibly know what they owe to pure science unless they receive instruction on the matter from the scientist. Because it affords such instruction in an easily assimilated form, the collected labours of a number of Cambridge graduates is eminently praiseworthy.¹

It is the very intricacy of the story of the scientific discovery which make it so difficult for the layman to understand how modern methods and inventions rest upon research which, at the time it was undertaken, bore no indication of utilitarian application. Indeed, it may be safely asserted that most, possibly all, the fundamental research which has led up to applied science was undertaken with no thought of its *utility* in the sense in which the word would be used by the layman. And it is this disregard of the utilitarian outcome of research which puzzles the layman, when it does not produce in him

¹ *Science and the Nation.* Essays by Cambridge graduates, with an Introduction by the Right Hon. Lord Moulton, K.C.B., F.R.S. Cambridge University Press, 1917, pp. xxii. + 328. 5s.

a feeling bordering on contempt. This is natural, and should be so regarded by the scientist. The man of affairs is accustomed to conduct his business on business lines, and looks for a substantial return for outlay within a reasonable time. If he is asked to invest in some scheme or other and cannot see that his capital will yield such and such a percentage of interest, either immediately or in the long run, who shall blame him if he withholds his support! Can a man so constituted and trained in business habits be expected to sympathise with the speculative dreamings, as it seems to him, of a recluse buried in a laboratory, unless it is clearly shown that no research should be writ down off-hand as incapable of revealing truths susceptible of being turned into benefits to the world in general and the commercial world in particular.

Though Minerva stepped forth from the head of Jove fully grown and clad in glittering armour, Jove had a dreadful headache and had to have his head split open with an axe. Discovery bursts forth resplendent on the vision of the layman, but there is a terrible amount of headache and head-splitting behind the scenes. The layman has a right to know this, if for no other reason than that it will make the wonderful yet more admirable. And until the layman has been so instructed, and so brought into a state of confidence towards pure science, it is just a little unreasonable to accuse him of "neglect of science."

"In research, all inquirers stand on steps others have built up."¹ He who would do science a service and demonstrate the wonderful and devious and obscure manner in which recondite scientific research leads gradually towards applied knowledge of inestimable benefit to mankind, could scarcely find a better example than the history of antiseptic surgery. What could seem more remote from surgery than the earliest investigations by Pasteur on tartrate crystals? Yet, as we all now know, the study of solutions of tartrates

¹ Shipley, A. E., "The Revival of Science in the Seventeenth Century," in *The Cambridge History of English Literature*. Reprinted in *Studies in Insect Life*. London : Fisher Unwin, 1917, p. 294.

led to an inquiry into the cause of fermentation. Fermentation was discovered to be "due to the presence and influence of living organisms, and not, as was believed and taught at that time, to the supposed circumstance that putrefying animal or vegetable matter transmits, in some very mysterious way, its state of active decomposition to other substances."¹ Thus arose the conception, followed by proof, of *infection*; and as a natural corollary *disinfection* followed. Lister applied the principle of disinfection, and antiseptic surgery was born.

This is, of course, not more than the merest fraction of the whole story, for Pasteur's investigations laid the foundations of bacteriology, and, among other benefits, furnished man with a most useful knowledge of anthrax and rabies. "It is not possible to measure, or to put into words, the value of Pasteur's work and the range of his influence. All attempts to estimate or explain him are mere foolishness."² And yet his work developed in a perfectly natural and logical manner from the study of disymmetry in crystals and their power of rotating rays of polarised light.

An equally romantic chain of investigations lies behind the following words by Professor Nuttall:—"Trypan blue constitutes the only drug hitherto found of practical use in the treatment of piroplasmosis; it has been successfully used for some years in the treatment of dogs, horses, and cattle."³ The history of coal-tar products stretches back to a youthful experiment by William Perkins, who thought he could make artificial quinine by the oxidation of aniline by bichromate of potassium. He did not make quinine; but he did make a most unpleasant-looking mess which, dissolved in alcohol, formed the first of the long series of aniline dyes.

Instances of the development of recondite and purely academic research into discoveries of enormous practical value are innumerable. Pure science does not and cannot know what the outcome of research may be. And this, it appears

¹ *Science and the Nation*, p. 238.

² *Pasteur and After Pasteur*, by Stephen Paget, F.R.C.S. London: A. & C. Black, 1914, pp. xiii. + 152. 3s. 6d.

³ *Science and the Nation*, p. 273.

to me, is the point which has to be driven home to the general public before the "neglect of science" will cease. This will be no light task; but every little helps, and *Science and the Nation* will doubtless do its share.

I wonder how many regard pure science as an ingredient in empire building. How many persons who derive economic benefits from the development of South Africa—to take a single example—stop to think that enormous natural difficulties have to be overcome before colonisation is possible as a paying proposition? And how many people are aware that arduous, trying, and often disappointing work, by many men in many laboratories, mostly undertaken with no other desire than to acquire knowledge for its own sake, has gone to make protozoology what it is; and that protozoology has made colonial agriculture a possibility? Turning again to South Africa, we are assured that the Veterinary Division may be regarded as essentially the nucleus of the Agricultural Department, "as in most provinces of South Africa the first step towards the establishment of an Agricultural Department has been the employment of one or more veterinary surgeons to inquire into and deal with the numerous animal plagues imported into and peculiar to this country."¹

But, lest it should appear that the materialistic side of the benefits of science is being unduly laboured, let me conclude by reminding the reader that there is another, and not less important, function of science. This could scarcely be put more pithily than in the words of Professor Fraser Harris: "Apart altogether from the way in which science makes for technical efficiency, it is a means second to none in the training of the intellectual powers. It trains us in accuracy of observation, in the power of drawing trustworthy conclusions, in habits of precise thinking generally; and these are not small things."² *And these are not small things.*

DAVUS SUM, NON EDIPUS.

¹ *The Department of Agriculture of the Union of South Africa : A Short Account of Its History, Organisation, and Activities.* Pretoria: Government Printing and Stationery Office, 1915.

² Harris, D. Fraser, "The Man of Science in the Community of To-day." Address delivered to the Nova Scotia Institute of Science. Reported in *Nature*, 17th May 1917, pp. 238-238.

NOTE ON THE TRANSMISSION OF ANIMAL TRY-PANOSOMIASIS IN NORTHERN RHODESIA BY BLOOD-SUCKING FLIES OTHER THAN *GLOSSINA*.

IN 1908 a disease made its appearance amongst cattle grazing on the northern banks of the Zambezi. This disease was confined to an area extending from Livingstone to Sesheke, and was popularly called "Sesheke sickness." A number of vague rumours spread about—rinderpest, East Coast fever, and a number of other African pests were connected with this disease. It remained for G. E. Owen,¹ M.R.C.V.S., to banish all the rumours, and to prove that "Sesheke sickness" was in reality trypanosomiasis. Owen considered the parasite to be of the *Dimorphon* type. The disease is essentially chronic.

The first people to lose cattle were the transport riders, and these people were to a great extent responsible for the spread of the disease. The history of every native kraal where trypanosomiasis occurred showed herding of white men's cattle, temporary hire of them, or exchange. Horses and dogs had never been known to contract the disease naturally, and there are numerous horses and dogs in the Sesheke district. There can be no question about the absence of *Glossina* in this district and in other places where the losses have been heavy.

One or two of the outbreaks of "Sesheke sickness" as recorded by Owen are interesting.

1. *Komopeli's Kraal*.—In 1908 this induna had over 300 head of cattle. In 1909 he hired out 3 oxen for temporary use to a transport rider, and they were returned the same year. These 3 oxen died. It is known that this transport

¹ Owen, G. E., "Report on Trypanosomiasis," 1912-1913. Manuscript.

rider had been through a fly belt with these cattle. Soon after the death of the 3 oxen some 50 of Komopeli's cattle sickened and died. Losses went on until 1913, always being heaviest in February, March, and April. In May 1913 Komopeli had only 20 head left.

2. *Limba's Kraal*.—In 1911 this induna owned 70 head of cattle at his kraal near the entry of the Ungwezi into the Zambesi. In 1911 he imported several fresh cattle from "up country," and soon after his cattle commenced dying. In 1912 he moved up to Simurku's with 21 head and had no losses. The following year he lost 7 head. This kraal is the only one in the whole of the district which had suffered any losses, and within a few miles 800 white men's cattle were segregated.

3. *Kushumuran's Kraal, Mambora*.—This man had no losses amongst his cattle until he took charge of A.'s cattle from Sesheke. Some of A.'s cattle died and his own commenced to die.

All the kraals in the cases mentioned above are in areas well removed from tsetse fly belts, and there can be no suspicion of the disease being transmitted by tsetse flies.

Owen is of the opinion that the transmission of "Sesheke sickness" is due to the *Tabanidae* by a process of mechanical transmission. The question of a cycle-carrier being present can be dismissed, for it is very difficult to explain why the disease has always confined itself to certain herds grazing over and close to the same veldt week after week as those which remain unaffected. Again, it is highly improbable that the other animals which are susceptible could escape.

Mechanical transmission suggests itself very clearly. From January to April *Tabanidae* and *Stomoxys* swarm around Sesheke and the flat land adjoining the Zambesi, and *Tabanidae* are a pest to horses, particularly when riding near herds of cattle. To stand near a herd of cattle when they are bunched together under a large tree at mid-day is just like standing between rows of bee hives when honey-making is in full swing. The *Tabanidae* literally swarm in

thousands, and there is one continual movement of blood-sucking flies. Owen says "the sign is an object lesson, and makes one realise that laboratory methods could not possibly approach anywhere near these conditions which occur in nature."

The disease only becomes noticeable each year about the beginning of February and finishes by the end of May. Fresh cases are practically never seen after the middle of May. In tsetse areas infection would not be confined to any particular months, and, needless to say, horses and dogs would not escape.

On 22nd February 1912 two cows were obtained suffering from trypanosomiasis. Two cows, whose blood was non-infective, were placed in the same kraal, (*a*), and herded by day together. Another kraal, (*b*), was constructed 20 yards away from that containing the infected cattle, and three clean cattle were placed in it. The cattle from kraal (*b*) were herded away from those of kraal (*a*).

On 26th March one of the sick cows in (*a*) died, but another infected animal was obtained almost immediately to replace it. On 5th April one of the healthy cows in (*a*) developed trypanosomiasis. On 24th April the other healthy cow became infected. In kraal (*b*) the three healthy cattle remained uninfected up to 21st May, when the experiment was concluded. The experiment points to the fact of mechanical transmission by *Tabanidae*, and to the improbability of a cycle-carrier being present as agent in spreading the disease.

When Owen took up the study of "Sesheke sickness" in 1912 the annual number of cases must have totalled 1000.

The method of dealing with the outbreak was to segregate all the obviously infected cattle. Natives were ordered by their indunas to either collect and segregate their infected cattle or to kill and eat them. That the method was successful is borne out by the fact that in the summer of 1914 no further cases of trypanosomiasis were reported as having occurred between Livingstone and Sesheke.

Kinghorn and York,¹ in an article on "Trypanosomes Infecting Game and Domestic Stock in N.-E. Rhodesia," mention a case where trypanosomes were found in a cow which had been bred on the Government farm at Fort Jameson, and had never been outside the limits of the township. Tsetse flies had never been seen within some miles of the place, but *Stomoxys* was abundant in the kraals, and at certain seasons various species of *Tabanidae* were common.

Hart² records his experience of finding many cattle infected with trypanosomiasis on a farm in N.-E. Rhodesia, which was in a fly-free area; *Glossina morsitans* existed 20 miles away. The infected cattle did not present clinical signs of the disease. It was thought that the *Glossina* might have followed a herd of game or elephants, but the farmers were emphatic that no tsetse had been seen. *Pangonia* were numerous. Hart conducted a rough experiment similar to that devised by Owen. Three old cows, brought from an area well away from any fly belt, were kraaled with two oxen showing trypanosomes in their blood. The five cattle were kept constantly together and fed close to the house to eliminate the chance of a stray tsetse coming along, which was very improbable.

These cattle were placed in contact on 11th April 1911, and were immediately bitten by *Pangonia* and *Stomoxys nigra*. One of the cows developed trypanosomiasis and was killed.

Montgomery and Kinghorn³ in 1907 suggested that *Stomoxys calcitrans* and *hyperosia* were also capable of transmitting trypanosomiasis.

An attempt was made by Kinghorn and York⁴ to transmit *Trypanosomiasis rhodesense* by *Tabanidae* and ticks. *Tabanidae*, as they were caught, were placed on a monkey, and a small proportion fed. The monkey did not become

¹ Kinghorn and York, *Ann. Trop. Med. and Parasitol.*, 1912, vol. vi. pp. 301, 315, quoted by *Trop. Vet. Bull.*, 1912, p. 80.

² Hart, Rupert L. L., *Journ. Comp. Path. and Therap.*, vol. xxiv. pp. 354, 356.

³ Montgomery and Kinghorn, *Ann. Trop. Med. and Parasitol.*, June 1908, vol. xi. No. 2.

⁴ Kinghorn and York, *Ann. Trop. Med. and Parasitol.*, vol. vii. No. 2.

infected. All the flies that fed, viz. 128, were dissected the same day. Flagellates, confined to the mid- and hind-gut, were found in seven. This experiment appears to have been devised to observe if cycle transmission takes place by means of *Tabanidae*.

For tick transmission experiment the ticks had to be brought from the plateau. Each group of ticks was fed on an infected monkey, and after an interval of a month on a clean monkey. The result was negative. These attempts at cycle transmission, although negative, are interesting, but any attempts at cycle transmission by flies (other than *Glossina*) and ticks are invariably negative.

Duke¹ attempted to transmit trypanosomiasis with *Stomoxys nigra* and *calcitrans*. The flies were fed first for a varying number of days on an infected monkey, and then placed daily on clean monkeys until the termination of the experiment at the death of the last remaining fly. None of the monkeys became infected. In all 363 flies were dissected—those dying during the first four days of the experiment were discarded, but although no flagellates having crithidial or trypanosome structure were seen, two interesting organisms were discovered. One was a flagellate and the other a crescent-shaped body, often present in enormous numbers in the gut of the fly.

Jowett,² in an article on the "Trypanosomiasis of Portuguese East Africa," details an interesting case of an ox, No. 48, which had lived on one station for eight years. On the particular station trypanosomiasis had not made its appearance until after the arrival of ten head of cattle some four months prior to Jowett's visit. To reach the station these ten animals travelled a considerable distance by road, and presumably became infected *en route* or in the locality from which they came. Ox 48 was a local animal, and must have become infected from one or other of the introduced cattle. Other cattle also became infected.

¹ Duke, H. L., *Report of the Sleeping Sickness Commission of the Royal Society*, 1913, pp. 89, 93.

² Jowett, W., "Note on a Cattle Trypanosomiasis in Portuguese East Africa," *Journ. Comp. Path. and Therap.*, vol. xxiii. p. 217.

In a further article dealing with the Portuguese East Africa trypanosome, Jowett¹ describes some experiments in which he endeavoured to transmit trypanosomiasis by interrupted feeding of *Stomoxys* and *Hematopota*. All the experiments with the *Stomoxys* were negative, but in one experiment where *Stomoxys* and *Hematopota* fed a positive result was obtained.

Commenting on the transmission experiments, Jowett writes: "With regard to the particular biting fly or flies concerned in spreading the disease under natural conditions, nothing definite is known. From the evidence collected during the course of our investigations in the field the members of the expedition considered it reasonable to assume that—

"1. In all cases outbreaks of the disease have occurred in a herd of cattle after the introduction of members brought from a distance, and which may have been subjected *en route* to the attack of one or other species of *Glossinae*.

"2. In all cases it seems clear that, following the advent of the imported cattle, locally bred animals of mature age which have never previously shown symptoms of illness have contracted the disease in localities in which there is no evidence of the presence of the *Glossinae*."

Rogers in 1901 proved that *Tabanus* in India are capable of transmitting *Trypanosomiasis evansi* within twenty-four hours of the infecting meal. *Trypanosomiasis equinum* has been spread from the sick to healthy by *Stomoxys* and *Tabanidae* (Sirvori and Leeler, 1902).

From the evidence obtained it would appear that the trypanosome can be and is spread in tsetse-free areas by the agency of biting flies. That *Tabanidae* are the worst offenders is becoming realised. *Pangonia* and *Stomoxys* have also been shown to be transmitting agents, and it is possible that any blood-sucking fly can transmit trypanosomiasis mechanically.

FRANK CHAMBERS.

¹ Jowett, W., "Further Note on a Cattle Trypanosomiasis of German East Africa," *Journ. Comp. Path. and Therap.*, vol. xxiv. pp. 32-35.

ABSTRACTS.

CLINICAL.

RUPTURE OF THE STOMACH AND CANCER OF THE PYLORUS IN A MULE
(Déchirure de l'estomac et cancer pylorique chez le mulet).
PIOT-BEY. *Rec. Méd. Vét.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 196-197.

A twenty-nine-year-old mule was admitted into hospital with symptoms of complete anorexia, salivation, ejection of blood-stained mucus from the rectum, no passage of faecal matter, and absolute anuria.

The conjunctiva was deeply injected. The temperature at first was 40·1° C., but fell to 37·3°. The extremities were cold and the pulse was scarcely perceptible. No treatment was tried. The animal lived from the 27th October to the 1st November.

Post-mortem examination showed acute peritonitis and the presence of ingesta in the peritoneal cavity. Along the greater curvature of the stomach to near the pylorus was a long rectilinear rupture, the tear in the muscular and mucous tunics not exactly coinciding. At the pylorus there was a tumour, almost as large as a fist, with irregular contour, and hard and resisting to pressure.

Section of the tumour showed that it consisted of fibrous tissue enclosing numerous clear, yellow, elliptical areas of definite outline. Microscopic examination proved it to be a carcinoma with extensive fatty infiltration.

CALCULI OF THE URINARY TRACT IN A HORSE (Calcolosi delle vie urinarie nel cavallo). G. B. SCOTTI. *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI., No. 2. 28th February 1917. Pp. 40-49.

This paper contains a very careful and complete account of the clinical manifestations and post-mortem conditions of a case of urinary calculi in a saddle-horse of about eighteen years of age, which was brought to the clinique because he had not been able to urinate for about twenty-four hours.

The previous history of the animal showed that, from time to time,

he had suffered from anorexia, with slight distension of the abdomen, and the emission of pultaceous faeces mixed with mucus. In the intervals there was constipation.

For the past five or six months there had also been urinary trouble. Sometimes, with evident exertion, a small stream of urine was passed, which suddenly ceased. The urine was thicker and darker than normal; and sometimes, after returning from a journey, it was reddish in colour and contained small blood-clots.

A clearly defined swelling, about the size of a pigeon's egg, was observed in the perineal region. Passage of the catheter proved this to be due to a calculus. Rectal examination revealed a distended bladder, pressure on which caused no expulsion of urine. About 2 litres of urine was withdrawn by puncture in order to permit of a better examination of the urinary organs. Palpation per rectum then revealed calculi in the bladder, as large as a nut and larger. The urine was yellowish-brown, turbid, thick, and stringy, of a slight ammoniacal odour, and deposited abundant crystals of carbonate of calcium.

An operation was performed and a calculus, about the size of a nut, removed from the urethra, along with others which varied in size from that of a pin's head to a grain of maize. The calculi consisted mainly of carbonate of calcium.

The operation was well supported, and the animal was returned to the owner on the tenth day. Other calculi, however, gave trouble, and the animal was finally destroyed.

On post-mortem examination calculi were found in the pelvis of both kidneys. There was a muco-purulent pyelitis and catarrhal inflammation of the ureters. The bladder contained small calculi and a certain amount of sabulous deposit, with a larger calculus, shaped like a bean, about 3 cm. by 1.30 cm., slightly rough on the surface and, like the other calculi, composed almost exclusively of carbonate of calcium. The mucous membrane of the bladder was dark red in colour and indurated.

The inflammatory process in the pelvis of the kidney appeared to be of more recent origin than that of the bladder.

TREATMENT OF A SEVERE WOUND WITH THE POLYVALENT SERUM OF
LECLAINCHE AND VALLÉE (Traumatisme grave de l'encolure.
Guérison rapide, sans complication, par le sérum polyvalent
Leclainche et Vallée). CHOULEUR. *Rec. Méd. Vét.* Vol. XCIIL,
No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 116-117.

As the result of a motor car accident a mare was severely wounded on the 8th December 1916. The neck was held rigid, in a manner

similar to that of tetanus. On each side of the neck was a vertical wound—one at the base and a little distance from the anterior border of the scapula, the other at the junction of the middle and lower thirds. These contused wounds led into a large tunnel, directed obliquely from right to left and backwards, in the fleshy mass just above the vertebral column. By exploration shreds of tissue and a piece of wood the size of one's little finger were extracted.

A preventive injection of 10 c.c. of antitetanic serum was given in the first place. The wound was then cleaned with boiled saline (8 in 1000) and copiously syringed with Leclainche and Vallée serum. The use of the serum was continued night and morning until a cure was effected.

The next day—the 9th December—the mare was much prostrated and refused all food. The pain appeared greater; and there was some suppuration, cording of the lymphatics, and oedema. The temperature was 39° C. This condition continued until the 14th December, from which date there was improvement.

Apart from a fresh exploration, necessary to open up a small cul-de-sac, the case proceeded favourably, and the mare was returned to work after twenty-seven days of treatment, without complication and almost without suppuration.

(An account of the specific serum treatment of wounds by MM. Leclainche and Vallée was abstracted in this *Review*, Vol. I. p. 51.)

TORSION OF THE UTERUS IN A BITCH (Torsion de l'utérus chez la chienne. Hystérectomie, guérison). R. CHOLET. *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 21st December 1916. Pp. 410-414. 2 Figures.

A pregnant bitch had pains for some days before coming under the care of Cholet. On examination the mucous membranes were found to be very pale and the abdomen very large and extremely sensitive, especially on the left side. The diagnosis arrived at was dystokia of maternal origin with metro-peritonitis.

Laparotomy was performed under atropomorphin and chloroform. Because of the pallidity of the mucous membranes and the feebleness of the patient, 100 c.c. of physiological saline was injected. The abdominal cavity contained sero-sanguinous fluid. The gravid (right) horn of the uterus was gangrenous and adherent (from localised peritonitis) to the neighbouring organs, and especially to the bladder. The left cornu was empty.

The right cornu contained two embryos and was bent upon itself.

The body of the uterus was in a state of semi-torsion, thus offering an obstacle to parturition.

Hysterectomy was performed, and the animal recovered.

RENAL HÆMORRHAGE IN AN Ox (Hémorragie rénale foudroyant chez un bœuf). PIOT-BEY. *Rec. Méd. Vct.* Vol. XCII., No. 23. 15th December 1916. Pp. 683-684.

A fifteen-year old bullock, which had been resting for five days, died suddenly, with no symptoms except general trembling for a very short time before collapse. The animal was in good condition in spite of six months' continuous work.

On post-mortem examination, made about twelve hours after death, the mucous membranes were noticed to be extremely pallid, this leading to the suspicion of an internal haemorrhage. The abdomen was little inflated, the rectum only slightly protruding. The peritoneal cavity contained a large amount of clotted blood which suggested the rupture of a large vessel. The haemorrhage, however, had occurred from the posterior part of the right kidney, whose capsule was enormously distended by a clot and presented a large rent by which the blood had escaped into the peritoneal cavity.

DIETETICS.

EWES' MILK: ITS FAT CONTENT AND RELATION TO THE GROWTH OF LAMBS. E. G. RITZMAN. *Journ. Agric. Res.* Vol. VIII., No. 2. 8th January 1917. Pp. 29-36. 3 Tables, 1 Figure.

The sale of good early lambs is of economic importance in sheep husbandry, therefore it is advisable to have breeding ewes of good milking capabilities. Ewes' milk has a higher fat content than that of cows'. It has not been the subject of much research, but what has been done shows that great variation exists between individuals of a breed and at different periods during the lactation of individuals. By tables are shown the average and range of fat content of ewes' milk at different ages and the variation in the fat of the milk of individual ewes in different years. There is also shown the average increase of lambs in weight at eight weeks on varying quantities of dams' milk varying in fat. In graphic form is illustrated the rate of increase in weight of lambs by four-week periods from different quantities of ewes' milk. The importance of breeding from ewes of good milking strain is obvious.

(R. G. L.)

ENERGY VALUES OF RED-CLOVER HAY AND MAIZE MEAL. H. P. ARMSBY, J. A. FRIES and W. W. BRAMAN. *Journ. Agric. Res.* Vol. VII., No. 9. 27th November 1916. Pp. 379-387. 12 Tables.

Previous investigation into the net energy values of red-clover hay and maize meal by Armsby and Fries gave discordant results. The present experiments were for the purpose of obtaining additional data. The summary of the results of five feeding periods with cattle, two with differing amounts of clover hay alone, and three with clover hay and maize meal in differing quantities, are as follows:—

“ 1. The metabolisable energy per kilogramme of digested organic matter was found to be 3·52 therms for the clover hay and 3·76 therms for the maize meal, as compared with 3·49 therms and 3·80 therms, respectively, as previously reported.

“ 2. The average increment in heat production caused by the consumption of 1 kilogramme of dry matter was as follows:—For clover hay, 954 Calories; for maize meal, 1143 Calories.

“ 3. When these results are combined with those of previous experiments, the following corrected values for the average heat increment per kilogramme dry matter are computed:—For clover hay, 973 Calories; for maize meal, 1289 Calories.

“ 4. The average net energy values per kilogramme of dry matter obtained by the use of the foregoing averages were: For clover hay, 981 Calories; for maize meal, 1913 Calories.”

(R. G. L.)

SESAME CAKE AS FOOD FOR MILKING Cows (Il panello di sesamo nell' alimentazione delle vacche da latte). R. GIULIANI. *La Clinica Vet.* Vol. XL, No. 1. 15th January 1917. Pp. 16-27.

Experiments with sesame cake gave the following results:—

The cake was readily eaten by the cattle and had an appreciable effect upon their live weight. It had a favourable influence on the quantity of milk, producing an increase which varied from 1·35 per cent. to 4·50 per cent., the maximum increase coinciding with the feeding of 1·5 to 2 kilogrammes per head per day. The minimum increase coincided with the feeding of 2·5 kilogrammes per day. The solids and fat were, however, diminished. Sesame cake does not appear to have any effect upon the coagulability of the milk or the character of the cheese made from it. The only effect upon the cream was to reduce its colour to a pale yellow. Though the making of butter from the milk was uninfluenced as to time taken in the process, the quantity of butter was reduced. One and a half kilogramme of cake per day lowered the melting point of the butter 1° to 2° C. Other effects upon

the butter were the alteration of its colour (paler) and the production of a softer consistency.

Taking all the results into consideration, Giuliani concludes that sesame cake is a good concentrated food for milking cows, and, to obtain the best physiological and economic effect, should be given in quantities of not more than 2 kilogrammes per head per day.

CALF-FEEDING EXPERIMENT. CRUSHED OATS COMPARED WITH STANDARD Calf Meal. *Journ. Depart. Agric. and Tech. Instr., Ireland.* Vol. XVII., No. 2. January 1917. Pp. 257-259.

This is another of the number of calf-feeding experiments which have been carried out from time to time by the above Department. In this instance crushed oats has been compared with the standard calf meal composed of one part ground flax-seed, two parts oatmeal, and two parts maize meal. It has been shown elsewhere that it is unnecessary to prepare calves' food by boiling or steeping it in boiling water and then mixing the mash with the separated milk. Preliminary tests by the Department confirmed this. In order to bring the matter under the notice of Irish farmers, and to obtain further data, this experiment was arranged. The calf meal was prepared in the usual way, by either boiling it or steeping in boiling water, and was fed to the calves with the separated milk. The crushed oats was given dry and the separated milk was given alone.

Tests were carried out at thirty centres in seventeen counties in the usual manner; 101 calves were used in each lot and the duration of the experiment was 116 days. Details of the experiment, set out in tabular form, show that there was an average gain of 3 lbs. per head in favour of the calves fed on crushed oats.

At the majority of the centres no difference in the general appearance or condition of the calves could be observed.

The cost of producing live-weight increase distinctly favoured the oats, by which a saving was effected of 5s. 3d. a cwt.

(R. G. L.)

THE SCANDINAVIAN METHODS OF VALUING AND USING FEEDING-STUFFS. *J. Wilson. Journ. Dept. Agric. and Tech. Instr., Ireland.* Vol. XVII., No. 2. January 1917. Pp. 208-217.

Till the middle of the eighteenth century the only available foods for cattle during the winter months were meadow hay and straw, with a very limited quantity of brewery by-products and oil-cakes which were prepared in a very primitive fashion. The cattle, therefore, wintered badly. Although the turnip had been introduced for more than a century, it was not until 1730 that progress was made in its cultivation,

which thereafter steadily increased. Before the end of the eighteenth century swedes and mangolds were introduced. With the advent of the Brahma press the crushing of oil-containing seeds became more general and more effective, and the residual cake was harder, contained less oil, and consequently had better keeping qualities. Thus the availability of roots and cakes increased the farmer's supply of foods and enabled him to so improve his winter feeding that even fattening could then be carried out. For some time after the introduction of these foods farmers used both classes in excess, and as much as 200 lbs. of turnips and 10 or 12 lbs. of linseed cake was given daily to a beast being prepared for the show-yard. Obviously close observation and experiment were needed to determine the nutrient values of these new foods.

Albert Thaer, born in Hanover in 1752, became the head of the first agricultural school in Germany and was the pioneer in experimental stock-feeding. He introduced to Germany the English system of agriculture—the interpolation of turnips and clover between the usual grain crops. Thaer then wished to know the feeding values of the newly introduced crops and of the others in common use. He therefore set about comparing them with meadow hay. He experimented with working bullocks by withdrawing portions of their allowance of hay and substituting turnips, etc., and so determined how many pounds of turnips or other foods were required to maintain a bullock in the same condition as when hay was fed alone. The author gives the general results of Thaer's experiments. Thaer's method of experiment had fallen into disuse before the advent of the many new foods, and a new line of investigation was followed—that of laboratory research by the chemist and physiologist—instead of appealing direct to the cow. Thaer's results and those of his immediate successors were not in complete agreement, and chemists, instead of inquiring into the causes of the differences and improving the experimental methods, taught that the efficacy of a food-stuff depended upon its albuminoid content. This doctrine was generally adopted and remained in use for nearly half a century. Though this extreme view was modified by German workers, Wolff and Kühn still attributed to albuminoids an importance which did not tally with the experience of successful stock-feeders. Only quite recently, chiefly through Kellner's work, the findings of scientists came into line with those of practical stock-feeders. From our present knowledge it may be said that animals require a certain minimum amount of digestible albuminoids, growing animals and those giving milk requiring most. The absolute minimum has not been determined, but no grown or three-quarters grown animals are likely to be given an insufficiency. Nobody advises that the minimum should be given. The surplus digestible albuminoids,

after the body has taken its physiological requirements, is available for productive purposes, and its value is in the proportion of 0·94 to 1 of digestible starch or to 1·91 to 2·41 of fat. Thus the surplus protein has a value less than either starch or fat for production.

These figures are of little use to the farmer. He buys various foods containing nutrients in different proportions; what he wants, therefore, is a set of figures which tell him the relative feeding values of the various foods. The Danes and Swedes returned to Thaer's method of experiment, at the same time taking advantage of the work of the German investigators.

Hansson (Sweden) experimented on these lines, and the author having explained, with examples, the method by which comparative values are found, gives a table of these values, with barley standing as the unit, taken from Hansson's book on stock-feeding. In addition to the comparative feeding values the relative cost of the foods listed may also be learned from the tables.

The Scandinavians feed their cows according to milk yield and the profits they are likely to give.

It has been found that bullocks weighing 1100 lbs. can be maintained on 20 lbs. of hay; the maintenance requirements of such a bullock can be stated in terms of the Scandinavian food units thus: It has been found, and is shown in the table, that 2·5 lbs. meadow hay are equal to 1 lb. barley (1 lb. of barley is taken as the food unit), therefore a 10 cwt. bullock can be maintained on eight units ($\frac{2.5}{2.5} = 8$) of food.

Tables are given showing the number of units required for dry cows in calf, and for cows giving different quantities of milk after calving. With the Scandinavian food-unit method it is possible to compute economic rations for cows throughout the course of their lactation period, and the author illustrates his remarks with suggested rations for cows giving 50, 40, 30, and 20 lbs. of milk daily. Further, the amount of nutrients given to milch cows must be increased as the fat content rises; thus, when the milk contains 3·5 per cent. of fat, one unit of food produces 3 lbs. of milk, but, when the milk contains 3·6 per cent. of fat, one unit of food is necessary for every 2·95 lbs. of milk, and so on, as is shown in a table.

(R. G. L.)

THE MAINTENANCE REQUIREMENTS OF HORSES AND THE THERMIC AND DYNAMIC VALUES OF THEIR FOOD-STUFFS. R. G. LINTON. *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Pp. 116-130. 1 Chart.

It has been pointed out by others that Kellner's method of calculating production starch equivalents has been erroneously applied when estimating the maintenance requirements of oxen.

This has resulted in misleading conclusions. It is here shown that the same mistake has been made when formulating daily rations for horses. From an examination of the existing literature it is concluded that 13,000 Calories or 7·6 lbs. of maintenance starch equivalents suffice for the maintenance of a 1000 lbs. horse. From calculations made according to Rubner's surface law there is shown by a graph the maintenance requirements for horses of from 500 lbs. to 1900 lbs. weight. Daily rations for working horses should be calculated on thermic as well as on dynamic values. The relative values of food-stuffs for animals are commonly expressed only in terms of production starch equivalent; for fifteen of the more common foods given to horses both maintenance and production starch equivalents are here given. Failure to reckon the maintenance portion of a working diet on its thermic value leads to false adjustment.

(AUTHOR.)

CHEMICAL COMPOSITION, DIGESTIBILITY, AND FEEDING VALUE OF
VEGETABLE-IVORY MEAL. C. L. BEALS and J. B. LINDSEY.
Journ. Agric. Res. Vol. VII, No. 7. 13th November 1916.
Pp. 301-320. 24 Tables.

Vegetable ivory, or the corozo-nut, is the seed or nut of the palm-like plant *Phytelephas macrocarpa*. It is found in great quantities along the banks of the Magdalena in Colombia, and also in Peru and in Ecuador. In the earlier stages of growth the seed contains a clear, insipid liquid, which later changes to a sweet, milky paste, and finally hardens into the white horny substance from which it derives its name "vegetable ivory."

The nuts are used for the manufacture of buttons, and the residual sawdust and chips have been mixed with other ingredients as cattle foods and as adulterant of concentrates. In America considerable attention has been paid of late to the enormous amount of waste material produced by ivory-button factories. The dust has the appearance of a medium fine meal and is tasteless, odourless, and very hard. The authors here report the result of their extensive researches into the feeding value of the meal.

Vegetable ivory contains about 5 per cent. of protein and 75 per cent. of nitrogen-free extract. Fat and mineral matter are negligible, while crude fibre averages 7 per cent. The energy equivalent of the material ranks well with other carbohydrate foods. Sheep ate the ivory meal readily when it was mixed with other grains and digested it very thoroughly. Eighty-four per cent. of the dry matter and 92 per cent. of the nitrogen-free extract were digested. All the carbohydrates appear to have been hydrolysed and absorbed in the digestive tract.

Cows ate the material when mixed with other food without evidence of digestive disturbances. They refused to eat it if fed by itself.

When fed as an addition to a basal ration the increase in milk was sufficient to indicate its positive value as a productive food.

(R. G. L.)

GENERAL.

AUGUSTE CHAUVEAU. "Professor A. Chauveau." *Brit. Med. Journ.* No. 2926. 27th January 1917. P. 142. "Professeur Chauveau." C. GROLLET. *Rev. Path. Comp.* No. 130. January 1917. Pp. 1-2. "L'œuvre scientifique de Chauveau." H. MAGNE. *Rec. Méd. Vét.* Vol. XCIII., No. 5. 15th March 1917. Pp. 101-121.

Professor A. Chauveau, born 1827, died 4th January 1917, in his ninetieth year. Graduated from Alfort, 1848; Professor of Anatomy and Physiology at Lyons, 1863; Director in 1875. Graduated in Medicine, Paris, 1877, and made Professor of Experimental and Comparative Pathology at Lyons University. Inspector-General of Veterinary Schools and Professor of Comparative Pathology, Paris, 1886. Member of the Académie de Médecine, and President in 1913. President of the Société de Biologie, 1892-1897. Founded with Bouchard in 1899 the *Journal de Physiologie et de Pathologie Générale*; later the *Revue de la Tuberculose*. Published with d'Arsonval, Gariel, Marey, and Weiss, the *Traité de Physiologie Biologique*.

Grollet recalls with affection and reverence the great moral and material help Chauveau had rendered to the Société de Pathologie of Paris. He was president from its foundation in 1901, and took a continuous interest in its work. He presided at the closing meeting of the First International Congress of Comparative Pathology in 1912. The name of Chauveau was a name to conjure with; he had reached the highest peaks of scientific attainment, and he was the pride not only of every veterinary surgeon but of all humanity.

In his monograph on the life work of Chauveau, Magne ranks him, with Lavoisier, amongst the greatest of French investigators in medicine and physiology. More than sixty years devoted to biological studies made him an authority of the first importance, and his investigations in anatomy, physiology, and pathology resulted in many and valuable discoveries.

His text-book on *Comparative Anatomy*, published so long ago as 1855, was an immense advance on all predecessors, became rapidly

popular, and has been the student's classic ever since. To Chauveau himself his anatomical knowledge was a precious help in all his subsequent work.

In physiology his discoveries in cardiac circulation were the most important since Harvey. Experimenting with Faivre, in 1885, on the horse, whose slow heart action allowed him to follow every movement, he settled all current problems—the three phases of contraction, the changes of form and dimension correlated with cardiac pulsation, the action of the auriculo-ventricular and aortic valves, and the relation of that action to the normal sounds. In 1861, with Marey, he published the famous memoir on the graphic determination of the relation between the heart-beat and the movements of the auricles and ventricles. Three small indiarubber air-bags introduced into the heart cavities transmit to three tambours the variations in pressure which they register, while a fourth bag, applied to the chest-wall, registers the heart-beat—an apparatus of perfect precision and exquisite sensitiveness. Later he measured the "intersystole" between the auricular and ventricular systoles. On cardiac and arterial circulation he was the authority to whom doctors and physiologists owed all they knew, and his sphygmoscope, his manometer, his haemodromograph are still the best apparatus for measuring blood-pressure and velocity. He made auscultation an exact science, both with regard to the heart and to the lungs.

He published memoirs on the excitability of the spinal cord, on the origin of the cranial nerves, and on the part played by the pneumogastric nerve in contraction of the oesophagus. In a classic experiment on the nerves of the lips, larynx, and oesophagus he measured precisely the rate of transmission of the nerve-impulse. He demonstrated that by the section of the sensory nerves of the oesophagus a functional impotence results equal to that produced by the section of the motor oesophageal nerves.

His later years were devoted almost entirely to a new branch of physiology, the study of biological *dynamics*. This in the writer's opinion is the most important and original of all his work, though perhaps the least known. It is the study of the transformation of the chemical and potential energy of the food into energy, heat, and work. Chauveau's experiments were to determine from what substances animals obtain the energy they need, how they transform chemical potential into work and heat, and what are the laws governing these transformations.

Claude Bernard wrongly supposed that the sugar supplied to the circulatory system by the liver was burned up in the lungs. Chauveau corrected this error and showed that the sugar is consumed in the capillaries of the general circulation. He followed this up by perform-

ing with great care and skill exact experiments in blood analysis in the levator muscle of the upper lip and in the parotid gland of the horse, and proved that the glucose which disappeared in the muscle was equivalent to the work done and the heat set up by the muscle. He concluded that glucose was the immediate and necessary source of energy for the tissues. By means of the liver all foods, whether fats or albuminoids, are always finally transformed into glucose. The nutritive value therefore of a food ration should be based, not upon its number of calories but according to a more physiological criterion—the quantity of glucose the liver can obtain from it. Against Rubner's theory of *isodynamic* he set up that of *isoglycosic* food substitutes.

Chauveau was the first to approach this still unsettled question as a physiologist, and to show that the quality as well as the quantity of food is important; an equal number of calories does not always give equal values. Alcohol in particular he showed to be, apart from its toxic effect, an imperfect food, inferior to sugar, since it yields only heat and can never replace glucose—the source of all cellular activity.

He further disproved the former classic belief that the production of heat was the primordial function of living beings, pointing out that in the case both of cold- and warm-blooded animals, working at a high rate, heat is eliminated and not conserved, the chemical potential serving directly to maintain the vital activities of the tissues.

Chauveau stated the formula for the conservation of physiological energy thus: Potential energy = mechanical work produced + heat lost, proving it by considering the case both of static contraction (when the potential is entirely transformed, *via* physiological energy or "elastic energy," into heat) and dynamic contraction (when motion results and both work and heat appear). He showed that the efficiency of animate motors is increased by diminishing the load and increasing the speed, and extended the formula to inanimate motors—one of the few cases where engineers and mechanicians have learned from the biologist. He formulated the law (Chauveau's law) that the expenditure of energy by a muscle is proportional to the shortening and to the weight lifted.

In pathology Chauveau began to study the nature of viruses even before Pasteur. In 1865, taking the viruses of vaccinia, variola, and glanders, he proved by experiments in dilution, evaporation, and filtration that the solid matter only was active. Though he did not then conceive of the virus as *living*, he was able to classify contagious diseases into three groups—(1) Parasitic; (2) septic or septicoid; (3) virulent, with protoplasmic granulations (vaccinia, variola.)

In 1870 he proved by the celebrated experiment in castration by

torsion that septic gangrene is caused by vibrios, thus working up to the microbial theory on parallel lines with Pasteur.

Taking up in 1880 the study of vaccination, he first demonstrated that North African sheep, naturally immune to anthrax, yet died *from poisoning* when a large quantity of anthrax blood was ingested.

His study of the mechanism of attenuation resulted in the use of compressed oxygen in the preparation of vaccines.

In 1865 his researches into the relation of vaccinia to variola showed that while inoculations of vaccinia in the cow resulted in local eruptions only, in the horse the eruptions became generalised, thus supporting Jenner's theory that the horse is the natural home of this disease.

Inoculations with variola gave very different results from those with vaccinia, and the non-identity of these two viruses and the impossibility of the one passing into the other was definitely established.

He also proved that tuberculosis, with pulmonary lesions, was communicable by ingestion. He produced miliary tuberculosis also by ingestion, and proved the corpuscular nature of the virus. He distinguished between true tuberculosis and non-specific, non-inoculable, caseous lesions, and he held that human and animal tuberculosis were identical.

He was one of the first to maintain that microbes act, in causing disease and producing immunity, through the soluble substances to which they give origin.

In a laudatory summing up Magne shows that it was the training obtained in French veterinary schools which, added to his own genius for research, his perseverance, and natural insight, enabled Chauveau very often to succeed where others had failed. (F. R.)

SOME NOTES ON OUR ARMY HORSES. R. S. TIMMIS. *Bloodstock Breeders' Rev.* Vol. VI., No. 1. April 1917. Pp. 77-78.

The author points out the unique value of cavalry in modern warfare. The aeroplane does not take the place of cavalry for reconnaissance; it is a valuable additional arm. There is room for both the aeroplane and the horse; each has its specific duties.

No machine will ever serve as a substitute for mounted action against any arm, for raiding, or for the pursuit of a demoralised enemy.

Artillery and transport require the horse more than ever. The light howitzers and field guns, which are as numerous as pebbles on a beach, can only be drawn by horses. The pack-horse is extensively used for the transport of light ammunition over country and through mud impassable to wheels. Infantry, cavalry, and engineer units use many times more pack-animals now than they did formerly. No machine can ever replace the pack.

There is still room for improvement in horsemanship. A great number of horses have been evacuated to the veterinary hospitals through no fault of the enemy. If horses are to stand loss of rest, no bedding, uncertain hay supply, deep mud, exposure, and other trials, they must be looked after by expert horsemen.

(F. B.)

GENETICS.

CORRELATION BETWEEN THE SIZE OF CANNON BONE IN THE OFFSPRING AND THE AGE OF THE PARENTS. C. WRIEDT. *Journ. Agric. Res.* Vol. VII., No. 8. 20th November 1916. Pp. 361-371. 6 Tables, 5 Figures.

Jensen (*Tidsskr. Landökonom*, 1887, R. 5, Bd. 6, Hft. 3-4, pp. 234-256) and Wriedt (*Tidsskr. Norske Landbr.*, 1912, Aarg. 19, pp. 306-309; *ibid.*, 1914, Aarg. 21, Hft. 2, pp. 82-87) have found that in the Jutland and Gudbrandsdal horses the young, and relatively young, animals have given the best offspring, and that old animals very seldom produce high-class stallions. Both of these breeds are selected for heavy bones. On the other hand, in the English thoroughbred, which is selected for speed, old horses produce high-class animals for that purpose. These facts naturally suggested that an investigation should be made into the question of whether young parents are producing heavier cannon bones than old parents.

Though it is hoped that further data will be obtained later, the present study points to the following conclusions:—"The age of the parent has an influence on the circumference of the cannon bone of the offspring. Immature parents, two to four years old, give offspring with the same measurement of the cannon bone as parents as old as five to seven years. Parents older than ten years, considered as a class, give offspring with lighter cannon bones than parents ten years old and younger. In the breed examined there was found a larger percentage of individuals over average size whose parents were ten years old or younger. On the other hand, the average individuals and those smaller have parents which are just as frequently under ten years old as they are over. In other words, the lighter classes of cannon bone come as frequently from young as from old parents, but the heavier classes seem to come more frequently from younger parents. There seems to be some basis for the current opinion among breeders of Gudbrandsdal and other heavy breeds that young parents give better offspring than older parents.

"It is extremely difficult to connect the data obtained with current

genetic hypotheses and conceptions. The history of the Gudbrandsdal heavy horses leads one to expect heterozygosis." "The heavy but heterozygous Gudbrandsdal horses may well give light cannon bone, for their history shows the infusion of much light-horse blood. The writer hesitates to advance the tentative hypothesis that segregation of size factors in horses may be influenced by age, but some such hypothesis is necessary to account for the poor performance of older stallions when compared with young. Racehorse stallions have been known to give excellent results when very old, for they are not bred for the dominant heavy-bone characters. Draft horses of the Gudbrandsdal and other heavy-horse breeds have not given similar satisfactory results. The reason may lie in the possibility that older stallions and mares are responsible for more recessives, whereas the younger give more dominants. Any such hypothesis, however suggestive, must be recast in the light of future investigations."

HYGIENE AND PREVENTIVE MEDICINE.

COOLING HOT-BOTTLED PASTEURISED MILK BY FORCED AIR. S. H. AYERS, J. T. BOWEN, and W. T. JOHNSON. *Bull. No. 420.* Professional Paper. U. S. Dept. Agric. 27th October 1916. Pp. 1-38. 5 Tables, 20 Figures.

As the result of experimentation, the authors think that it is commercially practicable to cool hot Pasteurised milk in containers not larger than quart bottles, by forcing cold air downwards over them when the air is at a temperature of 40° F. (4·4° C.) or lower. The *Bulletin* contains data which it is believed will be of assistance in the practical application of this method.

Briefly stated, the complete Pasteurising and cooling by this method would be as follows:—

"Milk could be Pasteurised by the ordinary holder system at 145° F. for thirty minutes. It could then be bottled hot in special over-sized milk-bottles of the ordinary type and capped with ordinary sterile caps. Before being filled the bottles could be steamed for two minutes by running the crates inverted on the conveyer over steam jets; the bottles would then go through the bottling-machine in the hot condition and would be practically sterile. The crates of hot-bottled Pasteurised milk could then be cooled by stacking in a refrigerator room and blowing cold air through the crates. In the cold season outside air could be used for cooling, and in the warm season refrigerated air could be circulated through the crates.

"This process could be modified in two ways: the hot milk could be held in the bottles at 145° F. instead of in a tank, and the crates of hot Pasteurised milk could be cooled by spraying with cold water instead of air.

"From a sanitary point of view the important advantage of the process of bottling hot Pasteurised milk in hot bottles lies in the fact that bottle infection is eliminated, and if the bottles of hot milk can be cooled successfully by forced-air circulation, the process of Pasteurisation would be raised to its highest state of efficiency by relatively simple methods."

INSPECTION OF PRESERVED FOODS IN STERILISED TINS (Inspection des conserves alimentaires en boîtes stérilisées). R. GERMAIN.

Rec. Méd. Vét. Vol. XCIII, No. 5. 15th March 1917. Pp. 122-139. 3 Figures.

The author describes the methods of preserving meat in sterilised and hermetically sealed tins, and enumerates the various accidents in preparation which may lead to contamination and deterioration, thus necessitating the rejection of particular tins or sets of tins by the veterinary inspector. The meat may be bad before preserving; it may be imperfectly sterilised; or it may subsequently be contaminated by accident to the tin. The author prescribes rules covering each case and gives hints for the recognition of defects. (F. B.)

INFECTIOUS DISEASES.

SOME FACTS ABOUT ABORTION DISEASE. E. C. SCHROEDER and W. E. COTTON. *Journ. Agric. Res.* Vol. IX., No. 1. 2nd April 1917. Pp. 9-16.

The bulk of this paper is similar to that of which an abstract has already been given in this *Review* (see Vol. I. p. 124). "To prevent the further spread of abortion disease owners of uninfected cattle should be instructed to have careful agglutination tests for abortion disease made of all cattle they propose to introduce into their herds; and owners of infected herds should be taught that infected foetuses, also the afterbirth and discharge from the vaginas of aborted cows, are infected with abortion bacilli and must therefore be disposed of with care.

"The treatment of individual cows which have aborted or failed to

clean properly after parturition must be left largely to the good judgment of the practising veterinarian. If the uterus is given a proper chance to heal after it has been damaged by an abortion or a retained afterbirth, the abortion bacilli in it need occasion little worry, as they will rapidly disappear of their own accord, and it is very questionable whether reparative processes are not retarded rather than facilitated by douching with germicidal solutions which are strong enough to kill bacteria in a reasonable length of time, or the length of time during which they may remain undiluted in the uterus. Douching is no doubt good practice, but it is desirable that there be a flooding out, a washing out, a real physical cleaning of the uterus; and this can best be done with solutions which are healing rather than germicidal, soothing and not irritating."

THE DIAGNOSIS OF INFECTIOUS ABORTION OF CATTLE (BANG'S DISEASE),
WITH SPECIAL REFERENCE TO THE INTRADERMAL ABORTIN TEST.
J. REICHEL and M. J. HARKINS. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 847-862. 3 Tables,
4 Figures.

In their general review of the disease the authors give reasons for their preference for the term *Bang's Disease* rather than *Contagious* or *Infectious Abortion*, *Epizootic Abortion*, or *Abortion Disease*. They contend that while Bang's disease is always associated with *B. abortus* Bang, the above alternative terms are not limited to the specific disease caused by this organism. Moreover, the presence of *B. abortus* establishes the existence of Bang's disease, though this may never develop to the extent of producing abortion, sterility, retention of the placenta, or metritis.

The intradermal abortin, held by the authors as a valuable diagnostic agent, is prepared as follows:—From six to eight strains of *B. abortus* (Bang) are grown in Blake bottles of neutral glycerin agar at 37° C. until the maximum growth of each strain is obtained. The growths are then removed with sterilised physiological salt solution and made into one mixture. This is heated at 60° C. for one hour and then centrifugalised. The killed bacteria are again washed with physiological salt solution. The emulsion is filtered through four thicknesses of sterile cheese cloth, diluted so that each c.c. will contain approximately five billion bacteria, cultured for sterility, and preserved with 0·5 per cent. phenol solution.

The abortin is injected into the skin over one of the ligaments (?tendons) of the tail in a dose of 0·1 c.c. of the emulsion. Results are recorded forty-eight hours later, when a swelling over and above that

produced by the injection itself is regarded as a positive reaction. Some of the more pronounced reactions have been observed to persist for as long as ten days.

It is claimed that the intradermal abortin, prepared as stated above, is better than the abortin of the English Commission or the precipitated purified abortin of Meyer and Hardenbergh.

POSSIBILITIES AND LIMITATIONS IN CONTROL OF ABORTION. C. J. MARSHALL. *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. Pp. 157-158.

About a year ago seventeen large herds were handed over to the State Sanitary Board of Pennsylvania for treatment and observation. Considerable valuable information has already been gained, and the Board feels fully repaid for the expense and effort that has been made.

In the small herds in rural districts, where animals are seldom purchased, very few cases of abortion or sterility are reported. Complaints have been confined principally to large pure-bred herds. In one such herd abortion was common up to five years ago; but for the past two years there has been neither abortion nor sterility. It is believed that this is due to measures of isolation, cleanliness, and disinfection. Laboratory tests show that there are still infected animals in the herd; and nearly all have granular vaginitis, yet there is practically no trouble from sterility. The calves have been reared on un-Pasteurised milk, kept isolated from the older animals until they are safely in calf, and brought into the herd after they have dropped their first calf and become safely settled with the second. No vaginal or uterine injections have been given to those cows which have calved normally. The byres have been carefully disinfected once a week, and the posterior parts of the cows washed every day from the time of normal calving to the certain establishment of the next pregnancy.

Practically the same treatment has been followed in another large herd, yet a few abortions have occurred with the second crop of calves.

An experiment was tried on one of these farms. Twenty heifers—fed until weaning time on the milk from animals, some of which were known to be infected—were divided into two lots of ten each when ready to breed. Lot No. 1 was placed in a disinfected byre, about a mile from the regular dairy-barn, and attended by a man who did not work with the regular herd. Lot No. 2 was placed in the dairy-barn along with the regular herd. A separate bull was used for each lot. The bull used for Lot No. 1 had not been used and was not used for the other members of the herd. Lot No. 2 was served by the common herd bull. Lot No. 1 produced 100 per cent. of healthy living calves. In Lot No. 2 there was 90 per cent. of abortions.

VESICULAR STOMATITIS CONTAGIOSA. J. GREGG, F. X. M'GUIRE, G. J. GLOVER, A. GILLESPIE, and G. GREGORY. *Amer. Journ. Vet. Med.* Vol. XII., No. 4. April 1917. Pp. 221-222.

The writers of this paper have recently had experience of several thousands of cases of contagious vesicular stomatitis in horses and mules. They found that 85 per cent. of exposed horses, 75 per cent. of exposed large mules, and 25 per cent. of exposed small mules were susceptible. The period of incubation ranged from one to three days, and the duration of the disease was from seven to ten days. The termination was usually in complete recovery. In rare instances there was paralysis of the tongue, which usually disappeared in fourteen days. From the observations of the authors one attack confers an immunity.

Treatment consisted in isolation and sanitary precautions. Hyposulphite of soda in the drinking-water had a very beneficial effect. For local use the best results were obtained from the daily application of a solution of permanganate of potassium and alum (1 in 500) for four days. Fresh water was left before the animals at all times. Dry bran and oats seemed most palatable. Very little hay should be given.

A large micrococcus, from $1\text{ }\mu$ to $1.5\text{ }\mu$ in diameter, was obtained in pure culture from the vesicles on the tongue. The micrococcus was arranged in clumps, no chains being observed. It stained uniformly with all ordinary stains and was Gram-positive. Some details of its cultural peculiarities are given. Injection of a heavy suspension of the micrococcus into the peritoneal cavity of the rabbit and guinea-pig was negative. Of five cultures left alone for ten days only one had live organisms in it at the end of that time.

A mild form of the disease was produced in horses and mules by using cultures of the organism grown for about three months through many generations.

VESICULAR STOMATITIS IN CATTLE. A. EICHHORN. *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. P. 162.

An outbreak of stomatitis in cattle is described as it occurred in Kansas City. The condition bore so strong a resemblance to foot-and-mouth disease as to be reported as such. The tongue was affected in about 50 per cent. of the cases; but vesicles occurred very frequently on the dental pad as well as on the buccal mucous membrane. Only at the end of the outbreak was there observed any variation from the healing process of foot-and-mouth disease. This variation was in the form of a thick gelatinous pseudo-membrane covering the erosions and retarding healing. In no case were there foot lesions.

It was observed that in some instances, even when the healing

process was well established, new vesicles developed. In some cases new lesions formed after at least five days from infection. There was a notable lack of universal infection. In some pens 60 per cent. of the animals escaped.

In not a single instance did the temperature rise above 103° F., even in the initial stages of the disease. The above facts and inoculation experiments differentiate the outbreak from one of foot-and-mouth disease.

Three calves were inoculated by scarification and five intravenously. The two groups were kept separate. Scarification caused mouth lesions—though not very typical—in forty-eight hours. Intravenous inoculation, in some cases with pure lymph from the vesicles, failed to produce the disease.

Five pigs were inoculated between the digits with negative results. Rubbing infective material on the tongue of horses was also negative.

On the third day the horses were re-inoculated with recent material by scarification of the tongue. One of them developed the lesions.

Nothing definite has been ascertained respecting the etiology of the disease.

INFECTIOUS STOMATITIS. P. E. JOHNSON. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 882-883.

A description is given of an outbreak of the disease among range stock of South Dakota. Thirty-five ranchmen from various parts of the country had stabled their teams and saddle-horses in the barn in which the first cases occurred. From 90 to 95 per cent. of these animals developed the disease.

The disease spread most rapidly at first, and the first animals affected in a herd suffered more severely than those in which the disease developed later.

The treatment consisted in quarantine, separation of the affected from the non-affected, and washing the mouths of the affected with a solution of permanganate of potassium daily. Severe lesions were curetted and dressed once with tincture of iodin.

EPIZOOTIC LYMPHANGITIS: SYMPTOMATOLOGY (La lymphangite épizootique: symptomatologie). VELU. *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 99-104.

The author summarises the results of the personal observation of 300 cases of epizootic lymphangitis.

Clinically the disease may be divided into (1) an *atypical lymphan-*

gitis which remains localised at the wound of infection, and (2) a typical lymphangitis which leads to cutaneous lesions and often to lesions of the mucous membranes.

1. *Atypical Lymphangitis*.—In these cases the parasite remains localised in the wound. The most salient features of the local manifestation are a resistance to the process of healing and the formation of fistulae without obvious cause. The fistulae are often deep and may persist for a long time. Sometimes they last for weeks or months or even years without complication, and show no tendency to heal. At other times they gradually fill up and produce slightly depressed ulcers with irregular edges. The bottom of each ulcer is pink and formed by very small granulations, and from it is secreted a small quantity of mucous fluid containing the cryptococcus.

Most often the primary fistula contracts, small abscesses forming around it to produce new fistulae communicating with the old one. In all cases the fistulae discharge an irritating pus which is sometimes blood-stained. Exploration of the fistulae reveals the presence of lesions, such as necrosis of bone or alterations in ligaments and aponeuroses, sufficient to explain the formation of the primary fistulae, the production of the secondary ones, the abundance of pus, and the persistence of the symptoms.

Often the case remains in this condition and lymphangitis is not suspected. Surgical intervention may result in a radical cure.

The following forms of atypical lymphangitis have been observed :—

(a) Simple open wounds are very frequent.
(b) Simple fistulous wounds, with symptoms such as are mentioned above.

(c) Testicular localisation has already been described by Teppaz (*Bull. Soc. Sci. Vét., Lyon*. March 1911). The present writer has encountered five cases in the mule and four in the horse.

(d) Osseous lesions have been seen in seventeen cases (*Recueil d'Alfort*, 15th August 1915, p. 632).

(e) Lesions of the conjunctiva. In the six cases observed the lesions were bilateral.

(f) Cryptococccic phlebitis. One such case has been studied. It is mentioned here in order to indicate the variety of possible lesions.

(g) Two cases have been noted of cutaneous lesions in the region covered by the saddle. They had a strong resemblance to pustular contagious dermatitis.

2. *Typical Lymphangitis*. According to the localisation of the lesions it is possible to distinguish a cutaneous lymphangitis and a lymphangitis of the mucous membranes.

(a) Cutaneous lymphangitis.—The development of lesions of the

skin is described. Attention is called to the fact that the pus from small abscesses is blood-stained; while that from abscesses of larger size is creamy-white, thick, and viscid. In the largest abscesses, which are most frequently deep-seated, the pus is more serous.

(b) The lesions affecting the mucous membranes are very variable. Most commonly they appear as the last complication of a generalised lymphangitis. On the lips and about the nostrils they begin as small papules which become pustules, and continue as small umbilicated sores which discharge an oily, inodorous serosity. On the margin of the eyelids and about the inner commissure bilateral ulcerations appear in which very small granulations develop. On the conjunctiva, nasal mucous membrane, and at the margin of the lips, ulcers appear, which at first may be confused with those of acute glanders.

Left alone, epizootic lymphangitis may undergo a spontaneous cure (according to Teppaz this is always so), but most frequently the lesions tend to progress. Generalisation is very slow and may take months or years. It leads to gradual emaciation and cachexia, and finally to death from exhaustion.

EPIZOOTIC LYMPHANGITIS (La lymphangite épizootique dans la région de Meknès. Organisation de la lutte). AUBRY. *Rec. Méd. Vét.* Vol. XCII., No. 22. *Bull. Soc. Centr. Méd. Vét.* 30th November 1916. Pp. 337-345. (La lymphangite épizootique. Localisation. Durée d'évolution.) VELU. *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 7th December 1916. Pp. 385-388. (Observations relatives à l'incubation de la lymphangite épizootique.) H. CHAPRON. *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 30th December 1916. Pp. 402-404. (La traitement de la lymphangite épizootique.) CHÉNIER. *Rev. Path. Comp.* No. 127. October 1916. Pp. 13-14. (A propos de la lymphangite épizootique.) A. PETIT. *Ibid.* No. 127. October 1916. Pp. 14-17. (Sur la lymphangite épizootique.) CHÉNIER. *Ibid.* No. 131. February 1917. Pp. 11-15. (Contribution à l'étude de la lymphangite épizootique.) TRUCHE and GUIGNARD. *Rec. Méd. Vét.* Vol. XCIII. Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 64-68. (À propos de la lymphangite épizootique et de son traitement.) FAYET. *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 104-109.

Epizootic lymphangitis has been imported into Algeria by the army of occupation. Aubry has adopted prophylactic measures in a specially arranged lazaret. He thinks the infection is by way of wounds: the

virus being derived from the harness or from the soil, or carried by flies or the attendants in charge of the horses. He emphasises the importance of the *rôle* played by humidity in the spread of the disease.

Velu has collected statistics of the localisation of the lesions in 300 animals (127 horses and 173 mules). In 37·6 per cent. of the cases the lymphangitis affected the trunk and followed wounds produced by the harness. The limbs were involved in 19·33 per cent. of cases, the head in 16 per cent., the shoulders in 11·66 per cent., and the breast in 7 per cent. Lesions involving mucous membranes are the most intractable. Those of the withers and limbs are more amenable; while those of the loins, shoulder, and breast are still less serious. The most benign manifestations of the disease are those which appear on the head and chest.

As the result of observations on four horses Chapron concludes that the period of incubation ranged from eighty days in one case to 121 days in another.

From Chénier's clinical observations the period of incubation appears to be about two months. By inoculation of donkeys with pus taken from horses and mules affected with the disease, Delamotte found that the period of incubation ranged from twenty-seven to forty-five days.

Chénier advocates the cauterisation of the abscesses in combination with the use of internal remedies.

Petit, as a practitioner who has had to treat numerous cases of epizootic lymphangitis in Morocco, relates the results of his personal observations. In more than 200 cases he has never been able to verify infection by direct contact. The disease always occurs in a sporadic manner, but within a perimeter which is often very precise. Petit regards flies as the principal carriers of the disease.

Truche and Guignard report satisfactory results from the intravenous injection of galyl. Small doses, even if given frequently, and large doses at long intervals, do not give appreciable effects. It is preferable to give at least 3 grammes at eight days' interval. The tolerance of the animal is very considerable, and no inconvenience is caused by these doses. When it is necessary to give numerous successive injections, some induration of the perivenous connective tissue may occur at the point of injection, possibly as the consequence of the escape of drops of the medicament on the introduction of the needle. It is, however, no inconvenience to choose a fresh spot for each injection.

Fayet institutes a comparison between epizootic lymphangitis and sporotrichosis of man. From the analogy of the local lesions he has advanced the value of iodide of potassium, which has a remarkable effect in human sporotrichosis and certain other mycotic affections of

animals, combined with the use of tincture of iodin, as recommended by Châtelain.

BACTERIAL NECROSIS IN THE HORSE. E. F. STEEVENSON. *Vet. Journ.* Vol. LXXIII., No. 2. February 1917. Pp. 44-47.

The author relates his experience of a large number of cases he has met with in France. The disease occurred as a gangrenous dermatitis affecting principally the heels, coronet, and frog, and occasionally as necrosis affecting the tongue and gums. It also occasionally occurs in other situations. Cases in the mule are few and not severe.

The cause is the necrosis bacillus (Schmorl), accompanied by other "accidental" organisms. Anything which breaks the skin affords the bacillus lodgment. The onset of the disease is sudden, and lameness is the first symptom noticed. Areas of skin, from the size of a sixpence to that of a crown piece, are hot and very painful. These become necrotic and slough, leaving a granulating sore with ragged edges. In favourable cases the sores heal by granulation; in unfavourable cases the necrosis extends. In one case the necrosis spread from the middle of the tibia to the middle of the metatarsus, burrowing down to the bones of the tarsus and the tibia. Feverish symptoms are present.

Joint cavities and tendon sheaths may be opened by the necrotic process; the hoof may be sloughed; and oral fistula, exostoses of the phalanges, gangrene, and septicaemia may be complications.

SUPPURATING INFECTION OF THE CORONET AND PASTERN. J. F. D. TUTT. *Vet. Record.* Vol. XXIX., No. 1499. 31st March 1917. Pp. 405, 406.

The infection is seen in horses, but rarely in mules. The primary cause appears to be a wound which may be very minute. The infection is derived from mud, and consists in the following organisms in this order of frequency:—Staphylococci, streptococci, *B. necrosis*, *B. pyocaneus*. In those cases where treatment has been long or of no avail *B. necrosis* has been found to be the prevailing organism.

There may be no symptoms until the discharge of pus is observed. An erroneous diagnosis of "quittor" may be made. The discharge from the wound is foetid, and the wound if unchecked may involve the joint. The disease appears to be contagious. Affected animals, therefore, should be isolated.

Perchloride of mercury, iodin, Dakin's solution, and hydrogen peroxide have given unsatisfactory results; but crystals of permanganate of potassium have invariably produced good effects. Dead tissue is

removed from the wound, which is cleansed with a warm solution of cresol. Powdered permanganate of potassium is then applied daily until the discharge of pus has ceased, when boric acid powder is substituted.

EQUINE ULCERATIVE DERMATITIS (*Étude sur des cas de dermite ulcèreuse des équidés observés au Congo belge*). R. VAN SACEGHEM. *Bull. Soc. Path. Exot.* Vol. IX., No. 9. November 1916. Pp. 675-679.

The author has observed a number of cases of ulcerative dermatitis affecting African and European breeds of asses. Horses are susceptible to the disease, but the lesions are much less grave.

The clinical features of the disease resemble those of epizootic lymphangitis, but the cryptococcus is not present. In three cases of which details are given the lesions affected the breast, the carpal region, and the right side of the chest. The lesions consist of an ulceration of the skin and necrosis of the underlying tissues, with the formation of fistulae. Small, firm tumours develop round the ulcers, and contain a peculiar oily pus. The pus contained small cocci, $0.5\ \mu$ in diameter, in pairs, in masses, or in short chains. Cultivation on serum resulted in abundant growth of streptococci in short chains. Inoculation of pus into sheep gave negative results. Inoculation of culture into guinea-pigs produced a firm tumour in which pus developed.

The author proposes the name of *Dermatococcus congolensis* for the organism he isolated.

Treatment of the dermatitis was without avail.

EXUDATIVE PLEURO-PNEUMONIA OF GOATS (*Sulla profilassi e sulla cura della pleuropolmonite essudativa delle capre*). N. MORI. *Il Moderno Zootiatro. Parte Sci.* Vol. V., No. 12. 31st December 1916. Pp. 285-289.

Mori has published observations on this disease, and has given reasons for concluding that it is caused by an *Aspergillus*.

Serious losses have recently been caused by the disease in Central and Southern Italy, and it seems probable that it has been introduced by Serbian fugitive goatherds. The disease has not as yet been transmitted experimentally; but segregation or slaughter of infected herds is recommended, because in two outbreaks the introduction of the disease by infected he-goats is strongly suspected.

Good prophylactic and curative effects are claimed to have followed.

inoculations with the serous exudate, cleared of cellular elements and treated with toluol or ether.

ON A TICK-BORNE GASTRO-ENTERITIS OF SHEEP AND GOATS OCCURRING IN BRITISH EAST AFRICA. R. E. MONTGOMERY. *Journ. Comp. Path. and Therap.* Vol. XXX., Part I. March 1917. Pp. 28-57. 6 Charts.

This disease has already been referred to as "Nairobi Sheep Disease." It is a specific febrile disorder associated with acute gastro-enteritis, the virus of which can be conveyed by *Rhipicephalus appendiculatus*.

The paper contains an account of the distribution, mortality, clinical features, and post-mortem appearances of the disease. Early in the disease there is diarrhoea; the faeces being green, and sometimes containing blood or mucus. The duration of the disease is short, death usually occurring within two days of the appearance of the symptoms. The affected animals rarely live for four days.

In laboratory experiments the disease was transmitted to sheep and goats; but inoculation of cattle, horses, mules, donkeys, and other animals was negative. The virus is filterable; direct bacteriological examination is negative, and no visible growth occurs on the usual media under ordinary conditions.

As the result of his observations, Montgomery arrives at the following conclusions:—

Hæmorrhagic gastro-enteritis occurs principally in the Kikuyu country, where it would appear to be enzootic, manifesting itself as an epizootic only when large mobs of susceptible animals are exposed to infection.

Sheep and goats alone appear to be susceptible—the former to a much greater extent.

The disease is carried by the "brown tick" (*Rhipicephalus appendiculatus*). No other tick has as yet been proved, but further work is required to negative the possibility.

No success has yet been attained by different methods of preventive inoculation. The most favourable line appears to be by attenuating the virulence of the disease for sheep by passing the virus for several generations through the more resistant goat.

The eradication of ticks capable of carrying the disease should form the basis of preventive measures. *Rhipicephalus appendiculatus* is also the carrier of East Coast fever in cattle, and for its eradication cattle must be dipped every three days. There is no doubt that dipping cattle at a three-day interval will very greatly clear the ground of all ticks, and in their absence gastro-enteritis of sheep cannot spread.

THE OPHTHALMIC REACTION AND CONGLUTINATION IN THE DIAGNOSIS OF GLANDERS (Über die Verwertbarkeit der Ophthalmoreaktion und der Konglutation zur Rotzdiagnose, nebst Mitteilungen über die Technik der Konglutinationsmethode). E. GRÄUB. *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 3. March 1917 Pp. 129-154.

In the time before the war glanders was a very rare disease in Switzerland, but since 1914 the number of cases has increased in an extraordinary manner. In addition to sporadic cases there have been two great epidemic outbreaks. One of these occurred in the horses at Thun, the other in the remounts imported from North America.

In the writer's experience the ophthalmic reaction has proved very serviceable, but there are cases in which it fails. Moreover, the ophthalmic test may give a doubtful reaction from which it is impossible to establish a definite diagnosis.

An advantage of the ophthalmic reaction, in large numbers of horses and under circumstances of difficulty, is its easy application and the rapidity with which results are obtained.

The subcutaneous test has the disadvantages of the ophthalmic reaction in a more pronounced degree, and, moreover, is less easy of application. The appearance of antibodies after the subcutaneous test is also disadvantageous. By the application of the ophthalmic test and fixation of the complement the subcutaneous test is rendered unnecessary.

Conglutination has proved itself to be very good, and with the correct technique gives unequivocal results. Its disadvantages are its technical difficulty and the necessity for its performance at a centre. A detailed account of the technique of conglutination is given.

THE ADMINISTRATION OF ANTITETANIC SERUM. "A Report on Twenty-Five Cases of Tetanus." H. R. DEAN. *Lancet.* Vol. CXCII., No. 4888. 5th May 1917. Pp. 673-680. 2 Tables. "The Intramuscular *versus* the Intrathecal Route in the Treatment of Tetanus by the Injection of Antitoxin." D. BRUCE. *Ibid.* Pp. 680-682. 1 Table. "On the Intrathecal Route for the Administration of Tetanus Antitoxin." F. W. ANDREWES. *Ibid.* Pp. 682-685. "A Comparison of Subcutaneous with Intravenous and Intrathecal Administration of Tetanus Antitoxin in Experimental Tetanus." F. GOLLA. *Ibid.* P. 686.

Dean records notes on twenty-five human cases of tetanus, in all of which the wounds had been septic. In nine cases they had healed, or

practically healed, at the time of onset of tetanus. He points out that the possible results of antitoxic serum treatment fall under two heads: (1) To neutralise and destroy all the free toxin which is circulating in the blood and tissues, and to maintain in the blood and lymph such a concentration of antitoxin as shall be sufficient to neutralise the subsequent output of toxin from the infected focus. (2) To endeavour to obtain such a concentration of antitoxin in the central nervous system as shall serve to dissociate the toxin which has already reached the nerve cells. But he considers it is improbable that the second object can be attained.

One result of prophylactic injection is to prolong enormously the incubation period, with the result that tetanus may occur after the wounds have completely healed.

Dean thinks that there is reason to assume that the danger of intravenous injection has been exaggerated. The essential principle of serum treatment is to give a very large dose of antitoxin at the earliest possible moment. This object can be most easily attained by the intravenous route. The serum of patients was shown to contain free antitoxin at various intervals up to thirty-nine hours after an intravenous injection of 30,000 units.

Sir David Bruce sets himself to answer the question, Which is the better route—the intrathecal or the intramuscular? Experiments conducted by Sherrington on monkeys appear to prove that by the intrathecal route much better results are obtained. All the animals treated intramuscularly died. The majority of those animals treated intrathecally lived.

Andrewes points out that of the six routes by which tetanus antitoxin may be given in curative treatment, four—subcutaneous, intravenous, intramuscular, and intrathecal—are in general use, but concerning the relative advantages of each opinion is still widely divided. He prefers the intrathecal route, and states his reasons for the preference.

Golla gives the results of a series of experiments on cats and rabbits, conducted with a view to demonstrating the relative efficiency of the administration of antitoxin by the subcutaneous, intravenous, and intrathecal methods. The results show the great superiority of the intravenous and intrathecal over the subcutaneous method. This may be due to the slow absorption of tetanus antitoxin when injected subcutaneously. It is shown that, even when injected twenty-four hours later, antitoxin by the intrathecal route is more efficient than subcutaneous injection.

SHIPPING FEVER AS MET WITH IN A LARGE CITY PRACTICE. C. B. M'KILLIP. *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 6, February 1917. Pp. 692-696.

The object of this paper is to emphasise the enormous loss which shipping fever is causing and the need for radical measures of control. The general course of the disease, as found by M'Killip, is as follows:—Infection of the upper respiratory passages, with general signs of toxæmia, are the first evidences of the disease. As the case continues, the inflammatory process extends down the respiratory tract, and in a number of cases terminates in broncho-pneumonia, the most fatal complication of the disease. The mucous membrane of the sinuses of the head and eyes is involved early. The gastro-intestinal mucosa, in the majority of cases, is involved. Mucous diarrhoeas are common. Articular synovial membranes, tendon bursæ, tendons, ligaments, the pododerm and muscular tissue, undergo inflammatory or degenerative changes.

Certain structures suffer more frequently and earlier in the course of the disease than others. The earlier common complications mentioned are sesamoiditis in 6 per cent. of cases, laminitis 3 per cent., tendinitis of the flexors of the digit 2 per cent., gonitis 1·5 per cent., laryngoplegia 0·5 per cent., bicipital bursitis 0·25 per cent. Paralysis of muscles is not unknown. Recent cases have shown paralysis of the crural quadriceps with destructive changes not unlike those found in azoturia. The nervous system is fairly immune. Rheumatic complications become chronic and incurable, and account for permanent disabilities among those cases which do not die.

SURRA, NAGANA FEROX, NAGANA OF UGANDA, AND *TRYPANOSOMA RHODESIENSE* (Surra, nagana ferox, nagana de l'Ouganda et infections dues au *Trypanosoma rhodesiense*). A. LAVERAN. *Bull. Soc. Path. Exot.* Vol. IX., No. 9. November 1916. Pp. 731-737.

The author reports the case of two goats, immune to surra, but succumbing to the infection of the nagana of Uganda in fifty-two and ninety-six days. Another goat with an acquired immunity to Uganda nagana was infected with *Trypanosoma rhodesiense*. On recovering from the second trypanosomiasis the animal exhibited immunity to nagana ferox.

Yet another goat acquired immunity to nagana ferox, then resisted infection (two inoculations) by the Uganda nagana, but responded to *Trypanosoma rhodesiense*.

A sheep with acquired immunity to nagana ferox was infected with Uganda virus and died in less than three months.

The author concludes that nagana ferox and Uganda nagana are varieties of the same disease, but have no relation to *Trypanosoma rhodesiense*.

METHODS.

PROTEOLYTIC PEPTONE OF BEEF AND INTESTINAL MUCOSA IN THE PREPARATION OF CULTURE MEDIA (Applications d'une peptone protéolitique de viande et de muqueuse intestinale à la préparation des milieux de culture). J. BERTHELOT. *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 298-300.

The recent publication of an article by Douglas and Colebrook on the advantage of using a broth containing trypsin in making blood cultures (*Lancet*, 29th July, 1916, p. 180) has led Berthelot to make known the results of a research which was interrupted by mobilisation. In order that he might study certain members of the intestinal flora, he sought to make a medium as near as possible of the same nature as the intestinal contents. This he did in the following manner:—Equal parts by weight were taken of beef, pancreas, and intestinal mucosa of the pig. These were chopped finely and placed in a flask with a 3 per 1000 solution of CO_3Na_2 at 40°C . The mixture, saturated with chloroform, was kept at 40°C ., and constantly shaken until those elements susceptible of digestion by trypsin were dissolved. The liquid was then filtered through a fine cloth, and evaporated to dryness as quickly as possible in a vacuum at a temperature not exceeding 43°C .

From the proteolytic peptone so produced media have been made which gave better results than the more ordinary culture media in the study of the intestinal flora.

VEGETABLE BOUILLON AS A CULTURE MEDIUM (Sur l'emploi du bouillon de légumes comme milieu de culture). A. BERTHELOT. *C. R. Soc. Biol.* Vol. LXXX., No. 3. 3rd February 1917. Pp. 131-132.

From the Pasteur Institute, Paris, comes the following suggested formula for the preparation of a vegetable bouillon as a culture medium for certain organisms:—

Water	4 litres
Potatoes	300 grammes
Carrot	150 "
Turnip	150 "

Peel the potatoes, and either leave them intact or cut them into

two. Wash the carrots and turnips, and cut them into pieces about 1 cm. thick. Place all the vegetables in an enamelled iron pot with 4 litres of cold water. Boil for four hours, so as to reduce the liquid by one-quarter. Strain through fine linen. If the bouillon is now more than 3 litres, reduce to this quantity by boiling; if it is less, bring up to 3 litres by the addition of distilled water.

Render the bouillon *very faintly alkaline* by the careful addition of a 10 per cent. soda solution. Heat in the autoclave at 120° C. for half an hour. Let it stand for twenty-four hours in a cool place; pass through filter paper; decant and sterilise for twenty minutes at 115° C.

The bouillon is scarcely more coloured than ordinary beef broth, and in it a very large number of species of organism—saprophytic and pathogenic—will grow in more or less profusion.

OBSTETRICS.

REMOVING RETAINED PLACENTA BY INJECTING PLACENTAL VESSELS WITH SALINE SOLUTION. R. R. SHAW. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 60-61.

The manual removal of the retained placenta has many objectionable features dangerous to both operator and patient. The method suggested in this paper is simple and requires no costly outfit. The requisites for the operation are—A quarter-inch cannula 10 ins. long, a rubber tube 10 ft. long, a pump and pail, and 2 gallons of normal saline solution.

The cannula having been introduced into either the artery or the vein of the umbilical cord, the salt solution is slowly pumped into the placenta. As the placenta distends it is detached from the wall of the uterus. Uterine contractions are stimulated and aid removal of the placenta. The operation should be performed as soon after delivery as possible.

A solution of peroxide of hydrogen or permanganate of potassium may be used instead of the salt solution.

TREATMENT OF TORSION OF THE UTERUS IN THE COW (Fosterbevaegelser Aarsag til Udretning af Borslyngning). N. K. ANDERSEN. (Om Behandlingen af Borslyngning hos Koen.) G. SAND. *Maanedskr. f. Dyrlæger.* Vol. XXIX., No. 1. April 1917. Pp. 1-11.

For many years Andersen has realised the importance of movements of the foetus as an aid in the correction of mal-presentations, and has

often induced such movements by applying pressure to the eyes of the foetus. Last year he had to deal with a serious case of torsion of the uterus in a cow where there was little room for manipulation. He reasoned that if movements of the foetus can produce torsion, it ought to be possible to make similar movements assist in the correction of the torsion. He proceeded to put this idea into practice by inducing movements by pressure on the eyes of the calf. The calf reacted to the pressure, gave several violent movements, and the torsion was corrected. Parturition proceeded, and both the cow and the calf did well.

Since his first experience Andersen has had to deal with two similar cases. In one of these a breach presentation was complicated with torsion and rupture of the uterus; but here also stimulation of the hindquarters of the foetus finally resulted in the correction of the torsion.

Professor Sand, of the Veterinary School of Copenhagen, contributes an account of the history of the treatment of torsio uteri. In 1829 Irminger pointed out that the most important cause of the torsion was excessive movements of the foetus; and in 1851 Wegerer wrote on the influence movements of the foetus may have on correction of the condition, recommending that the calf should be used as an aid in the undoing of the twist. Wegerer advised the operation to be conducted with the cow lying down; but F. Meyer (1859) recommended the correction with the animal in the standing position. Eberhardt of Zurich, in 1893, pointed out that the movements caused by handling the foetus frequently result in correction of the torsion, and indicated the greater difficulty of correction if the foetus is dead. Correction by gripping and manipulation of the foetus was described by Skjottgaard in 1903.

Professor Sand describes a method of correction depending on abdominal pressure combined with rolling of the cow on to her back.

(F. K.)

PARASITOLOGY.

PULMONARY STRONGYLOSIS. W. B. HERMES and S. B. FREEBORN. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 862-868.

Death from pulmonary strongylosis is due to direct suffocation, but the economic importance of the disease is greatly enhanced in that an infestation of the parasites paves the way for secondary infections, such

as broncho-pneumonia. The entire life-history of the parasite not being known, the epidemiology of the disease is not completely understood, and, consequently, prophylaxis is uncertain. That the lung-worms, in the developmental stage immediately following the newly hatched larvæ, are dependent on swampy locations seems evident. Circumstantial evidence makes it clear that the disease is readily introduced by adult carriers.

The internal administration of anthelmintics, which may be excreted through the lungs, has proved only mildly successful as a line of treatment, because of the impossibility of giving a sufficient dose to be effective in the air-passages. Fumigation with sulphur or air-slaked lime usually results in saving about half of the animals and killing the rest.

The hope that an anthelmintic might be found that could be applied directly to the air-passages and produce a cure without fatalities led to a series of experiments instituted by the Laboratory of Parasitology of the University of California. The experiments were carried out for a period of over a year, during which time various substances, such as turpentine, benzine, ether, and chloroform were tried singly and in combinations, intratracheally and by the nose. Experiments on about 250 goats and calves led to the conclusion that chloroform (either chemically pure or commercial), administered by the nose in doses sufficient to nearly anaesthetise the animal, is a valuable simple method of treatment.

The chloroform is administered, first into one nostril and then into the other, by means of an all-glass syringe or a medicine-dropper. It is impossible to prescribe an exact dosage, but sufficient chloroform is given to produce "grogginess." Given proper care in food and shelter, three injections have been the maximum required in any one case.

The knowledge that prolonged chloroform anaesthesia may produce necrosis of the liver caused the authors to hesitate to recommend this method of treatment until the treatment of several hundred cases during a period of nearly three years has shown that the complication is negligible.

The experiments have shown that, though the worms are not killed immediately, death and disintegration of the majority takes place a few hours after treatment.

OTACARIASIS AND THE PROPHYLAXIS OF PSOROPTIC MANGE (Otacariasis et prophylaxie des gales psoroptiques). HENRY. *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 4th January 1917. Pp. 41-48.

THE PRESENCE OF PSOROPTES IN THE EARS OF SHEEP. J. F. CRAIG.
Vet. Record. Vol. XXIX., No. 1508. 2nd June 1917. Pp. 503-504.

Psoroptic otacariasis is well known in the rabbit and the goat, and has been described as occurring in the gazelle and the wild sheep (argali) of America. Henry now shows that it is not rare in the horse (frequent), the donkey, the mule, and the sheep (frequent).

Otacariasis of the Horse.—Although psoroptic mange has been held as affecting primarily those parts of the body which are covered with long hairs, the most common form of the affection, namely otacariasis, seems to have escaped the notice of observers.

In his first observations the author noted the condition in 71 per cent. of the bodies of horses dead of various diseases in a veterinary hospital. The majority of these animals were affected with mange, but mainly of the sarcoptic variety. Later, when the manifestations of otacariasis in the living animal were recognised, the affection was found in 42 per cent. of horses in another hospital where mange was rare, and sarcoptic when it did occur. Though these observations were made where the conditions for the spread of otacariasis were particularly favourable, it is nevertheless true that they demonstrate the great frequency of otacariasis as compared with psoroptic mange of the mane or body generally.

The lesions are rarely unilateral. Both ears are almost always affected and the mange is localised in the deepest part of the auditory canal, which contains a greyish-yellow conical plug composed of cerumen and epithelial scales. Psorops are readily detected by the naked eye as small whitish motile bodies on the surface of the plug or in its superficial layers. Because of the deep-seated nature of the lesion the affection cannot be determined by external examination: the symptoms must form the guide.

Among the symptoms pruritus is not constant, though it may be observed in warm stables or when the horse is standing in the sun. The animal may be noticed to rub the base of the ear carefully on some hard object; and repeated rubbing may produce signs varying from disarrangement or disappearance of the hair to sores or callosities. Hearing does not appear to be affected; nor are there complications such as otitis, etc.

Treatment is very simple, the careful injection of some psoropticide, such as 50 c.c. of a 2 or 3 per cent. warm, watery emulsion of cresyl, being sufficient. The injection should be made two or three times at eight days' interval in order to destroy recently hatched parasites.

Henry concludes that otacariasis is an important factor in the preservation and propagation of psoroptic mange, and suggests that an

animal should not be introduced into a stud or flock without the possibility of otacariasis being eliminated.

Henry's paper has caused Professor Craig to examine the ears of sheep for acari. Material from the ears of sixty-two animals was examined. Of these animals forty-nine had been slaughtered in the public abattoir in Dublin, and in them no psoroptes were found. In fifteen, however, other acari, chiefly *Tyroglyphus* and larvae of *Ixodes*, were demonstrated. The remaining thirteen sheep were from a flock affected with sheep-scab, and in three of these psoroptes were found. "It is therefore important that in the dipping of sheep affected with sheep-scab care should be taken that the dip should reach the inner side of the ear."

TREATMENT OF MANGE (Le traitement de la gale). CHAMPETIER. *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 68-72.

The chief disadvantage in using an oily dressing is the difficulty in cleaning the skin after cure has been effected.

Champetier has obtained excellent and speedy results from the following formula:—

Bicarbonate of soda	30 grammes.
Petrol	300 "
Oil of cade	20 "
Pea-nut oil	100 "
Bichloride of mercury	1 gramme.
Water	1000 grammes.

This is applied to the whole surface with a woollen cloth or a hair-brush. While the animal is still wet, the operation is completed by powdering with sulphur by means of bellows by which sulphur is dusted over vines. Two applications are generally sufficient, but sometimes it is necessary to give a third.

The disadvantage of this method is that it is not sufficiently mechanical, and therefore requires supervision. Under military conditions simpler methods, such as that devised by Descazeaux (see this *Review*, Vol. I. p. 32), are desirable. If a permanent bath is not available, the dressing may be applied after clipping by means of a machine such as is used for spraying vines for mildew. By this method the following mixture has given excellent results:—

Pentasulphide of potassium	25 grammes.
Cresyl	20 "
Arsenate of sodium	2 "
Water	1000 "

Unfortunately, cresyl contains non-saponifiable bituminous oils which soon clog the sprayer. The dressing, however, may be applied with a brush, a cloth, or a sponge.

Another mixture which has given satisfaction is the following:—

Pentasulphide of potassium	40 grammes.
Nicotin	1 gramme.
Arsenate of sodium	2 grammes.
Water	1000 "

Immediately after spraying the body is dusted with sulphur.

The application of the dressing with a spraying-machine is rapid and economical, and ensures that the liquid reaches all parts of the body, even those most hidden and least accessible.

EFFECTS OF REFRIGERATION UPON LARVÆ OF *TRICHINELLA SPIRALIS*.

B. H. RANSOM. *Journ. Agric. Res.* Vol. V., No. 18. 31st January 1916. Pp. 819-854.

The author records the effects of low temperatures on the vitality of trichina in infected pork. The infected meat was kept at the temperature stated for periods varying from a few minutes to fifty-seven days, and was then removed and allowed to thaw slowly at room temperature. A sample of the pork was finely divided and placed in an artificial gastric juice at 38-40° C. for a night, and the liberated trichinæ examined for movement on a warm stage. Although meat has been proved to remain infective after being kept at 15° F. for twenty-three days, this temperature is injurious to the trichinæ, but 10° F. is a critical point below which the effects of cold become suddenly much more pronounced, and at 5° F. only a very small proportion of the trichinæ survive more than five days, and protoplasmic changes take place. The author therefore concludes that trichinous pork should be kept at a temperature not higher than 5° F. for a period of not less than twenty days.

(J. H. A.)

COCCIDIOSIS (*EIMERIA STIEDÆ LINDEMANN*) IN THE DOG (Parasitischs Vorkommen von *Eimeria stiedæ* Lindemann in der Leber des Hundes). A. GUILLEBEAU. *Schweiz. Arch. f. Tierheilk.* Vol. LVIII., No. 11. November 1916. Pp. 596-602. 6 Figures.

Though cases are recorded in the literature, coccidiosis of the liver of the dog is very rare. The author has encountered two cases in dogs, ten and thirteen years old. During life a considerable enlargement of the abdomen was noticeable. On post-mortem examination the abdominal cavity was found to contain a large quantity of blood-

stained fluid. In both cases the spleen and liver were enlarged. In one case numerous soft, dark-red areas were visible on the surface of the liver. These areas varied from 0·5 cm. to 1 cm. in diameter. In both cases similar centres were scattered throughout the substance of the organ.

On a microscopic examination of scrapings from the centres in the liver, parasites measuring 7 μ by 12 μ with a nucleus 3 μ in diameter, were found mingled with erythrocytes. The parasites are much smaller than those of coccidiosis of the rabbit.

When sections of the less advanced nodules were examined, the liver cells were found to contain rounded parasites 1 μ in diameter, which, it was concluded, were the schizonts of coccidia.

AVIAN CYSTICERCUS (Contribution à la connaissance des cysticerques d'oiseaux). N. CHOLODKOVSKY. *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 219-222. 1 Figure.

Although the cystic stage of *tæniæ* is very commonly encountered in mammals, the bibliography contains very few references to similar parasitic conditions in birds. Diesing and Bremsers¹ mention a cysticercus of the abdominal cavity of *Perdix saxatilis* and the neighbourhood of the lungs of *Corvus frugilegus*, which they have named *Piestocystis variabilis* Diesing. Baillot² described a similar cysticercus in the peritoneum of the fowl. Leukart³ described and figured a cysticercus found in the lung of the raven; and Alessandrini⁴ described many cysts as occurring on the lungs of a fowl. All of these seem to be *Piestocystis (Dithyridium) variabilis* Diesing; and the *tænia*, of which they are the larval forms, is supposed to be *Mesocestoides lineatus* Goeze, a parasite of the fox and wild cat which very often devour fowls. Lastly, Neumann⁵ found cysts on the surface of the lungs in the diaphragmatic air-sacs and in the thoracic muscles of a fowl.

In almost all these cases the cyst appears to have been *plerocercoid* or *cysticercoid* rather than a true cysticercus, for in none, except that described by Baillot, was there a definite cavity.

This year Cholodkovsky received a piece of the preserved (in alcohol) lung of a cock covered with numerous spheroidal cysts measuring 3·6 mm. in diameter. A study of these showed that they were true specimens of cysticercus, enclosing a central cavity filled with a considerable amount of fluid which was coagulated with alcohol producing a flocculent precipitate. Each cyst contained a scolex 0·7 mm. in diameter, without rostellum or hooks, but furnished with four oval suckers 0·25 mm. in length. The scolex was visible through the wall of the cyst.

The cysticercus appears to belong to a species different from that of previously recorded cases, but it is not possible to determine to which *taenia* it belongs. The author, therefore, refrains from giving it a name, and simply refers to it as *Cysticercus sp. e gallo domestico*. From the character of the scolex it is evidently the cyst of a *Taenia inermis*; and there is every probability that the adult form has as its host one of the carnivores (fox, cat, polecat, badger, etc.) which prey on the fowl.

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¹ Diesing, *Systema Helminthum*, 1850, vol. i. p. 495. ² Baillet, *Histoire naturelle des Helminthes des principaux animaux domestiques*, 1866, p. 163. ³ R. Leukart, *Die Parasiten des Menschen*, 1879-86, vol. i. p. 435. ⁴ Alessandrini, *Boll. Soc. Zool. Italiana*, 1917, ser. ii. vol. vii. pp. 49-52. ⁵ See Neveu-Lemaire, *Parasitologie des animaux domestiques*, 1912, p. 571.

PIGS AND THE PERPETUATION OF HUMAN ECTOPARASITES IN THE TROPICS (Les porcins et la conservation des ectoparasites humains dans les régions chaudes). E. ROUBAUD. *Bull. Soc. Path. Exot.* Vol. IX., No. 10. December 1916. Pp. 768-771.

The author has already noted the remarkable relationship between certain blood-sucking larvae parasites of man and hairless mammals such as *Phacocharis* (the wart-hog) and *Orycteropus* (an edentate, not a pig). He now enumerates a series of human ectoparasites which are capable of living on other mammals. The human tick (*Ornithodoros moubata*) has been found in the burrows of the wart-hog and in the stybes of the domestic pig. The chigger (*Sarcopsylla penetrans* L.) has been found in abundance on pigs. In the Island of Principe, in the Gulf of Guinea, *Glossina palpalis* attacks the wild pig and follows his migrations. The pig mange sarcopt is easily transmitted to man. The goat mange sarcopt may be transmitted to both man and the pig.

These facts lead the author to the conclusion that pigs are the animals most closely related to man, in so far as possibilities of the nutrition of ectoparasites is concerned.

ANAPLOMOSIS. THE SIGNIFICANCE OF BODIES FOUND IN THE BLOOD OF SHEEP FROM SARDINIA AND PIEDMONT (Anaplasmosi. Sul significato dei "corpi endoglobulari," "punti marginali," "anaplastimi," trovati nel sangue degli ovini della Sardegna e del Piemonte). G. FINZI and A. CAMPUS. *Il Nuovo Ercolani*. Vol. XXI., Nos. 30-31. 31st October-10th November 1916. Pp. 493-500. *Ibid.* Nos. 34-35. 10th December-20th December 1916. Pp. 557-571. *Ibid.* Vol. XXII., Nos. 1-2. 15th January-31st January 1917. Pp. 2-8.

Much doubt has been thrown upon the pathogenic characters of

anaplasms, many observers having concluded that they are either artefacts—the products of degeneration resulting from anaemia—or the remains of other parasites of the blood.

Finzi and Campus found inclusions in the red-blood corpuscles of several sheep suffering from liver fluke. The coccus-like bodies, sometimes in the centre, but more often near the periphery of the blood-cells were considered to be identical with anaplasms. The authors were led to conduct experiments with an aim to the solution of the question respecting the nature of these bodies. They produced anaemia in sheep and rabbits, and state that bodies similar to "marginal points" were found in the red-blood corpuscles. From their observations they were led to conclude that it is not possible to affirm that anaplasmosis occurs in Sardinian sheep. The central and marginal bodies of the blood-cells are not always real parasites, but are frequently merely the result of changes due to anaemia.

Although convinced that all forms of disease described as anaplasmosis are not due to a specific protozoan, the authors admit that the work of Theiler and Lignères makes it necessary to consider anaplasmosis among the protozoan diseases.

PATHOLOGY AND BACTERIOLOGY.

ADENO-CARCINOMA OF THE PANCREAS OF THE DOG (Contributo allo studio dei tumori del pancreas nel cane). C. SARTI. *Il Moderno Zooiatro*. Parte Sci. Ser. V., Vol. VI., No. 1. 31st January 1917. Pp. 17-20.

A mongrel dog, five to six years old, apparently in a good state of health, well nourished and presenting no apparent abnormality, died without obvious cause. On post-mortem examination the liver was found to be much enlarged and studded with small greenish-yellow spots which gave it a marbled appearance. The pancreas was also enlarged and adherent to the duodenum and liver, and was the site of a tumour which had invaded the whole organ. The intestine, where it adhered to the pancreas, was stenosed with an infiltrated and reddened mucosa. There was no macroscopic alteration of any other organ.

Microscopic examination revealed extensive morphologic change in the above mentioned organs, and led to the conclusion that the condition was one of primary carcinoma of the pancreas with secondary invasion of the intestine and liver.

PSEUDO-TUBERCULOSIS OF THE PIG (Pseudo-tuberculose du porc).
P. CHAUSSÉ. *Rec. Méd. Vét.* Vol. XCII., No. 23. 15th
December 1916. Pp. 679-682. 1 Figure.

Fairly frequently nodular and caseous glandular lesions are met with in the pig, which are difficult to distinguish from tuberculosis. The present paper contains an account of five observations where inoculation of guinea-pigs demonstrated the non-tubercular character of lesions which macroscopic examination left in doubt. The observations seem to permit of a more exact definition of the naked-eye characters by which tubercular and non-tubercular lesions may be differentiated.

According to the author, non-tubercular nodules are not regularly spherical. They are not surrounded by a fibrous capsule. The caseation is complete and uniform, dry and with calcification. They are putty-coloured or greenish.

In lesions due to the tubercle bacillus the nodular form is very rare in the glands of the pig. Generally the tuberculosis is of the hypertrophic type in the form of masses extending through the whole or the greater part of the gland. While tuberculosis most frequently becomes generalised in the viscera, this is not so in pseudo-tuberculosis.

Chaussé has not investigated the cause of pseudo-tuberculosis of the pig.

MYCOTIC PSEUDO-TUBERCULOSIS IN A SOUTH AMERICAN HORSE
(Pseudo-tuberculose mycosique chez un cheval sud-américain).
BRINGARD. *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th
January-15th February 1917. Pp. 33-34.

The subject was a South American horse imported for army purposes. On arrival he showed, in common with other horses, marked debility, yellowish mucous membranes, constipation, and capricious appetite, caused by the fatigue of the passage and the vitiated atmosphere of the ship. Routine treatment with calomel and linseed mashes, containing bicarbonate of soda, proved of no avail. The mucous membranes became chocolate-coloured and frequent dull colics developed—symptomatic in these horses of sand in the intestine. Administration of eserin and pilocarpin and of mucilaginous enemata produced temporary improvement followed by increasingly grave relapses.

Three days later the animal became prostrate. The mucous membranes were jaundiced, the pulse fast and weak, the respirations quick and short, extreme tenderness was exhibited on pressure over the abdomen, more especially over the hypochondrium. The tempera-

ture was 39·6°. The urine was of a deep-red colour. Hepatitis of an indefinite nature was diagnosed and treated.

The fever abated somewhat, but almost complete coma supervened. The respirations became short and trembling, and the abdomen tympanitic. Symptoms of very severe colic were shown. The animal died on the following night.

Post-mortem examination showed emaciation and tympany of the carcase. The abdomen contained 4 or 5 litres of serous fluid with fragments of false membrane in suspension. The liver and adjacent flexure of the large colon were covered with a false membrane. The adjoining mesentery and peritoneum were much inflamed.

The lymph glands of the cæcum and large colon were much enlarged and showed in their neighbourhood the presence of greyish, slightly firm, nodular masses, having a superficial resemblance to tuberculous "grapes." A very large number of these nodules was also found in the liver, which was in a state of chronic induration.

Histological examination of portions of the tissue showed, without determining the existence of the fungus, that it was a case of generalised mycotic pseudo-tuberculosis.

(J. R. R.)

THE REACTION OF THE SPLEEN IN ACUTE INFECTIONS. F. A. EVANS.

Bull. Johns Hopkins Hosp. Vol. XXVII., No. 310. December 1916. Pp. 356-363. 1 Plate (3 Figures).

"The reactions of the spleen in the commoner acute infections merit more attention than that given them by the simple designation, acute splenic tumour. A complete understanding of the processes would go far in clearing up the obscure functions of the spleen, would do much in demonstrating the pathological physiology of many wandering cells of the body, and possibly point the way to a clearer appreciation of several pathological processes." The author concludes that acute splenic tumours fall into one or two major groups—the red type associated with typhoid fever and closely related infections, and the grey type with pneumococcus, staphylococcus, streptococcus, and other infections. In each type the spleen shows active congestion, upon the extent of which depends the size, consistence, and, in large part, the colour of the organ.

The red acute splenic tumour is characterised by hyperplasia and activity, as shown by phagocytosis of the reticulo-endothelial macrophages and decrease in the number of the other cells of the pulp. These changes are dependent upon a toxic inhibition of the leucopoietic functions of the body.

Histologically the grey acute splenic tumour is characterised by an

increase in the pulp cells, especially the oxydase-containing elements, without any proliferation or increased activity of the reticular and endothelial cells. These changes result for the most part from the functional demand for leucocytes.

PHARMACOLOGY AND THERAPEUTICS.

THE SUBCUTANEOUS INTRODUCTION OF SULPHUR INTO THE ORGANISM
 (De l'introduction du souffre dans l'organisme par la voie sous-cutanée). L. BORY and A. JACQUOT. *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 309-311.

In order that sulphur may exert its maximum effect in diseases of the skin investigation has been made with the endeavour to discover a method of subcutaneous administration. Different commercial preparations of colloidal sulphur, for intravenous or subcutaneous injection, have two disadvantages. On the one hand, colloidal sulphur is only a suspension of an insoluble product; on the other hand, the quantity of sulphur contained in a unit of volume is small.

The authors have set themselves the task of finding a true solution of sulphur which may be injected. They have found that camphor, oil of sesame, and oil of vaselin are tolerated by the organism and are capable of dissolving considerable quantities of sulphur.

If 5 grammes of powdered camphor and 1 gramme of precipitated sulphur are gently heated a mixture is produced which, though it solidifies homogeneously on cooling, can easily be dissolved at a gentle temperature in vaselin, oil of vaselin, and particularly in oil of sesame.

Oil of vaseline and oil of sesame are the two best solvents of sulphur. This is possible at a low temperature and takes about half an hour to effect completely in the following proportions:—

Precipitated sulphur	0·20 gramme.
Oil of sesame or oil of vaselin	100 c.c.

This is perfectly stable and keeps indefinitely.

The following preparation has given every satisfaction:—

Pure precipitated sulphur	0·20 gramme.
Eucalyptol	20 c.c.
Oil of sesame	80 "

The injection is made into the muscles of the buttock, care being taken that the needle does not enter a blood-vessel.

THE CONTROL OF STRYCHNIN CONVULSIONS BY INTRASPINAL INJECTIONS
OF MAGNESIUM SULPHATE. E. C. CUTLER and B. H. ALTON.
Journ. Exp. Med.. Vol. XXV., No. 1. January 1917. Pp. 83-92.
4 Tables.

"In cases of strychnin poisoning, text-books on pharmacology and therapeutics, even of recent date, advocate evacuation and washing of the stomach by tube and by the usual emetics, accompanied by the administration of tannic acid or some other astringent, to remove the portion of drug remaining in the stomach, and an attempt to control the convulsions by a depressant of the central nervous system, as urethane, chloral, bromides, ether, or chloroform. Kober (*Lehrbuch der Pharmakotherapie*, 2nd edit., 1908, pp. 674 and 487-493) advises, in addition, the use of small doses of curare, which must, however, be given with great care. Githens and Meltzer (*Journ. Pharmacol. and Exp. Therap.*, 1911, vol. ii. pp. 357-359, and *Proc. Soc. Exp. Biol. and Med.*, 1911, vol. viii. pp. 70-71) found that animals given a twice lethal dose of strychnin could invariably be saved by the use of intratracheal ether anaesthesia plus the intravenous administration of considerable quantities of Ringer's solution. The success of these experiments apparently depended on the effect of Ringer's solution in hastening the excretion of the strychnin, the anaesthesia merely controlling the convolution until the drug was eliminated."

Cutler and Alton planned a series of experiments to test the efficacy of the use of magnesium sulphate to control the convulsions in strychnin poisoning. At the outset they found some confusion in the statistics recording the minimum lethal dose of strychnin. Githens and Meltzer (*op. cit.*) considered 0·0004 gramme per kilogramme of body weight fatal in dogs when administered intravenously. Kober (*Lehrbuch der Intoxikationen*, 2nd edit., 1902, pp. 1153-1166) states that 0·0005 to 0·001 gramme per kilogramme of body weight is fatal for cats, dogs, sheep, and pigs. Experiments to settle this point were made and it was found that the minimum lethal dose for cats was 0·0004 gramme per kilogramme body weight.

By further experiment it was found that the animals to which a lethal dose of strychnin had been given could be saved by the intraspinal injection of magnesium sulphate. It is a method easily available and requires no special technique. The amount of magnesium sulphate to be used intraspinally should be 1 c.c. of a 25 per cent. solution to each 20 lbs. of body weight in adults. Should this not control the convulsions a small amount of ether may be used. In order to hasten the excretion of the strychnin, salt solution should be given intravenously.

THE ACTION OF DIGITALIS IN PNEUMONIA. A. E. COHN and R. A. JAMIESON. *Journ. Exp. Med.* Vol. XXV., No. 1. January 1917. Pp. 65-81. 1 Plate, 7 Tables.

Digitalis has been used for many years in the treatment of pneumonia, but there is still discussion as to whether its use is advantageous. A decision has been difficult because the difference between action as such and beneficial action has not been sharply drawn. A very full summary of the historical side of the question is given. It is recalled that experiments have been made to ascertain whether in the presence of fever any agents are at work which interfere with the action of digitalis.

In the experiments by Jamieson (*Journ. Exp. Med.*, 1915, vol. xxii., pp. 629-645) on dogs and cats, the problem investigated was whether pneumonic infection had an influence on the action of digitalis other than that exerted by temperature alone. He found no difference in normal animals and in animals when the infection was at its height. He concluded, therefore, that there is nothing in the nature of the infection to interfere with the action of the drug. This conclusion, however, does not mean that the heart in pneumonia is an altogether unchanged and intact organ. Newburgh and Porter (*Journ. Exp. Med.*, 1915, vol. xxii., pp. 123-128) have shown that it must be changed, for the hearts of animals infected with the Friedländer bacillus continue to beat when nourished with pneumonic blood, whereas such blood quickly poisons control hearts from non-infected animals. It is clear, however, from the results of Jamieson's experiments that, whatever the poison to which pneumonic hearts have accommodated themselves, its nature is not such as to interfere with the act of digitalis.

The observations at present recorded by Cohn and Jamieson go to show that digitalis acts during the febrile period of pneumonia, and that it produces a beneficial, possibly a life-saving, effect in cases of auricular irregularity. Whatever beneficial action it has on the function of the normally beating non-febrile heart may be expected from its use in the febrile heart in pneumonia.

A CONTRIBUTION TO THE PHARMACOLOGY OF STOVAIN. M. I. SMITH and R. A. HATCHER. *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 4. January 1917. Pp. 231-240. 1 Figure.

Of recent years much has been written on the uses of stovain as a local anaesthetic; but more definite knowledge of its relative toxicity and anaesthetic activity as compared with cocaine and other locally acting members of this series is needed.

The toxicity of the drug was determined by intravenous injections of solutions of different concentrations into the femoral veins of cats, rabbits, and guinea-pigs.

The experiments gave results which point to the following conclusions among others:—

There is no evidence that intravenous injection of stovain produces any direct action on the blood-vessels of cats. The drug causes death by inducing immediate and simultaneous paralysis of the heart and respiration, the action on each being independent of that on the other. Little or none of it is excreted unchanged in the urine of the cat.

The fatal dose of stovain for the cat is about 30 milligrammes per kilogramme body weight when a solution of 1 per cent. is rapidly injected into a vein. Somewhat more is required when dilute solutions are used. Complete recovery follows the injection of a toxic, but not fatal, dose within a short time, and several times as much as a single fatal dose may be administered within a few hours if small portions are given at short intervals. Very large doses are required by subcutaneous injection to cause death.

Stovain is slightly, but distinctly, more toxic than novocain.

EXPERIMENTAL STUDIES ON THE RELATION OF THE PITUITARY BODY TO
RENAL FUNCTION. K. MOTZFELDT. *Journ. Exp. Med.* Vol.
XXV., No. 1. January 1917. Pp. 153-188. 43 Figures.

In recent papers Motzfeldt has dealt with the clinical aspects of the relation between the pituitary body and the kidneys, especially with regard to the etiology and pathology of diabetes insipidus. He has come to the conclusion that the pituitary body, as shown by its extracts, exerts a constant physiological influence on the functional activity of the kidneys in human beings. This action consists in a checking of the flow of urine. He has also reported a case of diabetes insipidus in which organotherapy with the posterior lobe of the pituitary body has been successfully carried out for a period of two years.

During the past year Motzfeldt has investigated the question experimentally, and has found that extracts of the pars intermedia and posterior lobe of the hypophysis given by mouth, subcutaneously, or intravenously, are able to check polyuria. Extracts of the anterior lobe have a similar effect, but only to a slight degree. This antidiuretic effect is constant and is independent of changes in blood-pressure, intestinal absorption, and the vagi. The effect is apparently prevented or delayed by division of the splanchnics, and is diminished by division of the renal nerves near the hilus of the kidney. A similar antidiuretic property is possessed by β -amidazolyl-ethylamine

ρ -oxyphenylethylamine, a preparation of *Secale cornutum*, small doses of nicotin, large doses of caffein, and extracts of the adrenal cortex.

The antidiuretic effect is absent or only slightly marked in checking the so-called salt diuresis.

No effect on polyuria is produced by strychnin, morphin, adrenalin, extract of thyroid, extract of thymus, extract of pineal, extract of pancreas, or extract of corpora lutea.

PHYSIOLOGY.

THE SEMEN OF DOMESTICATED AND OTHER MAMMALS (Le processus d'éjaculation du sperme chez les animaux domestiques (cheval, chien)). E. IWANOW. *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 230-233. (Le sperme de quelques mammifères.) *Ibid.* Pp. 233-235.

Observations have shown that the semen of the horse and dog is not ejaculated in the form of a continuous stream, nor as a mixture of the secretion of the accessory sexual glands and spermatozoa, but in an interrupted manner and in a definite chronological order. The first portion to be extruded is a clear fluid derived from the glands of the urethra. This may be produced, as is known, in castrated animals in which the accessory sexual glands are atrophied. The bulbo-urethral glands (of Cowper) secrete the second portion in the horse.

The third part consists of spermatozoa diluted with the secretion of the prostate, and possibly also with that of the seminal vesicles. The author, however, inclines to think that the secretion of the seminal vesicles comes last.

The effect of the prostatic secretion in increasing the activity of spermatozoa is well known; but the function of the secretion of the glands of the urethra and the bulbo-urethral glands is not so clear. The first portion of the semen of the horse and dog collected in non-sterile pipettes in a non-sterile manner remained in its original condition for several (eight) months in some of the pipettes (closed at both ends). This seems to suggest that the secretion of the urethral and bulbo-urethral glands may have a bactericidal action, and that it thus acts upon urethral flora.

The quantity of semen of the dog varies from 0.5 c.c. to 30 to 40 c.c.; that of the ram does not exceed 2 to 5 c.c.; while that of the horse may be more than 300 c.c., but is generally 50 to 100 c.c.

THE RESPIRATORY PROCESS IN MUSCLE AND THE NATURE OF MUSCULAR MOTION. W. M. FLETCHER and F. G. HOPKINS. *Proc. Roy. Soc.* Vol. LXXXIX., B., No. 619. 1st March 1917. Pp. 444-467. 7 Figures.

Hitherto the cause of muscular contraction has been held to be the explosive splitting up of a molecular complex—Hermann's "ingen"—the high irritability of which was supposed to be due to the inclusion of "intramolecular oxygen." The explosion was followed by the re-building of a new oxygenated molecule of "ingen" by the combination of fresh carbon bodies and, possibly also, lactic acid. That is to say, according to this hypothesis, there was a process of construction of unstable complexes of oxygen-containing protoplasm alternating with destructive change resulting in the discharge of energy accompanied by the formation of certain end-products of recognisable character.

The Croonian Lecture of 1915—the publication of which has been unavoidably delayed—put an entirely different complexion on the problem. It was shown that the oxidations which are always associated with muscular activity take place *after* the liberation of muscular energy; and are concerned not with the induction of muscular contraction, but with the restoration of the state in which contraction is possible.

Oxygen, therefore, is not required for the construction of "ingen," but for immediate oxidation. Actual muscular contraction is an anaerobic function. The conception of a chemical "ingen" must consequently be replaced by the hypothesis that by a relatively simple chemical change a carbohydrate in muscle gives rise to lactic acid which induces tension changes causing contraction.

SEROLOGY AND IMMUNOLOGY.

THE CONGLUTINATION TEST FOR GLANDERS (La prova della conglutinazione nella diagnosi della morva). A. MAGAZZARI and L. ERRANI. *Il Moderno Zootrofo.* Parte Sci. Ser. V., Vol. VI., No. 1. January 1917. Pp. 1-6.

This test is based on the experiments of Ehrlich and Sachs,¹ who, in 1902, observed that if washed red-blood corpuscles of the guinea-pig, fresh horse serum, and inactive (heated to 56° C. for half an hour) cow serum be brought together, haemolysis takes place. In 1906² Bordet and Gay showed that there was also a very pronounced

agglutination of the red-blood corpuscles due to a substance in the cow serum to which Bordet and Streng gave the name "Conglutinin."³

In 1912 Pfeiler and Weber⁴ experienced good results from the application of the conglutination test to glanders. According to these authors the test is preferable to that of fixation of the complement because simpler. In 1913 Andersen⁵ confirmed the importance of the test, and was in complete accord with Pfeiler and Weber in claiming for it great value in the diagnosis of glanders.

In 1914 Michin⁶ explained the technique of the method, and reported the results of its application to 200 horses. Of these forty-one gave a positive reaction and were found to be affected with glanders on post-mortem examination. He affirmed that the test gave as good, or even better, results than fixation of the complement, and certainly better results than the agglutination test.

Waldmann⁷ made comparative experiments with conglutination and complement-fixation, using serum from three horses artificially infected. Greater promptness and sensitiveness of the former method was demonstrated. Reeser's observations⁸ also showed that conglutination gives as good results as agglutination or complement fixation.

The paper now published by Magazzari and Errani contains the results of the application of the test to twenty-eight horses, of which seven were healthy, six suspect, and fifteen affected with glanders. They consider that the reaction is exceedingly sensitive and easily appreciated without uncertainty. It demonstrated glanders in an indubitable manner in thirteen of the fifteen horses with the use of 0·05 c.c. of serum, and in six cases with 0·025 c.c. only.

Certain difficulties of the method are pointed out, but the authors believe that they are justified in concluding that conglutination is an absolutely certain method of diagnosis of glanders.

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ANAPHYLACTIC SHOCK IN DOGS. J. P. SIMONDS. *Journ. Inf. Dis.* Vol. XIX., No. 6. December 1916. Pp. 746-753. 2 Charts.

"Anaphylactic shock in the dog is associated with a fall in blood-pressure. During the period of low pressure the reaction to injections

of epinephrin is either absent or greatly diminished, while the response to nicotin may be augmented. It is believed that the mechanism of the latter is chiefly dependent on its effects on respiration, and only to a limited extent, or not at all, on direct stimulation of the vaso-motor centre or the sympathetic ganglia. There is evidence for the belief that there is present a condition of decreased irritability of the sympathetic ganglia and possibly of the vaso-motor centre. The prompt rise in arterial pressure after injections of nicotin associated with dyspncea is evidence that in anaphylactic shock in the dog there is no constriction of the vessels of the lungs."

RINDERPEST. PREPARATION OF ANTISERUM. A. W. SHILSTON. *Bull. No. 64.* Agric. Research Institute, Pusa. 1916. Pp. 18.

During the past ten years the procedures adopted in the preparation of anti-rinderpest serum at the Muktesar Laboratory have been frequently revised and improved as the result of experiments directed to finding a means of raising the potency of the serum, and effecting economies in its manufacture. Difficulties of accommodation and fodder supply have made it necessary to ascertain whether any modifications of the existing methods could be effected with the object of increasing the yield of serum proportionately to the number of cattle employed.

Recent observations in the preparation of anti-diphtheritic, anti-tetanic, and other sera have shown that antitoxin content reaches its maximum from five to seven days after injection of the antigen (toxin, culture, etc.), into the serum-making animal, and that from this time the potency of the serum falls fairly rapidly.

Little attention appears to have been given to this point in the case of anti-rinderpest serum, but since a reduction of the interval between injection and bleeding would effect a saving both in the cost of feeding and in the number of animals required for serum making, the matter is one of some importance when a large output of serum has to be maintained.

As the result of a series of experiments Shilston comes to the following conclusions:—

1. The interval allowed between the injection of the rinderpest blood and citrate solution mixture and the first bleeding for serum in hyperimmune animals may, with advantage, be reduced to eight days, as the immune bodies are then present in full amount.
2. By taking three bleedings at the rate of 6 c.c. per lb. body weight on the eighth, twelfth, and sixteenth days after injection a mixed serum

was obtained of equal (hill bulls) or increased (buffaloes) potency to that obtained by taking two bleedings fifteen and seventeen days after injection at the rate of 6 c.c. and 8 c.c. per lb. body weight respectively, as was done in the routine method followed at the Muktesar Laboratory.

3. The actual yield of serum after each injection was increased from 6·79 c.c. per lb. body weight by the two-bleedings system to 9·6 c.c. per lb. by the three-bleedings system, or an additional 2·81 c.c. of serum per lb. body weight; an increase of 41·4 per cent. on the former output.

IMMUNITY STUDIES ON ANTHRAX SERUM. A. EICHHORN, W. N. BERG., and R. A. KELSER. *Journ. Agric. Res.* Vol. VIII, No. 2, 8th January 1917. Pp. 37-56. 6 Tables, 1 Figure.

By his classical work in 1881 Pasteur showed that it was possible by the use of attenuated cultures of *Bacillus anthracis* to immunise animals against otherwise fatal doses of anthrax organisms. Though in general Pasteur's vaccine has proved highly satisfactory, and has been extensively used with excellent results, it has several disadvantages. It requires two handlings of the animals; the desired degree of immunity is not reached until approximately a week or ten days after the injection of the second vaccine; there is a small percentage of losses in vaccinated animals due directly to the vaccine; and the keeping qualities of the vaccine under favourable conditions are not the best. These disadvantages have led several investigators to attempt modifications of the method, and some have directed their efforts towards the preparation of an immune serum through hyperimmunisation. The immunity conferred by anthrax serum, however, is of short duration, lasting only a few weeks. To produce more lasting immunity a mixed method of serum and vaccine has been used. Numerous experiments have shown the value of anthrax serum as a curative and prophylactic when employed simultaneously with anthrax spore vaccine.

Recalling the work on the separation of diphtheria antitoxin by fractioning the serum by the use of ammonium sulphate, the writers of the present paper applied this method to anthrax serum, and succeeded in producing the antibodies in a concentrated form. Their methods of procedure and tests are stated in some detail, and the following account of an outbreak of anthrax is given in illustration of the favourable results obtained by the use of anthrax-globulin:—

During a recent outbreak of anthrax in a herd of animals near Richmond, Va., anthrax-globulin preparations were used with very good results. In the course of a week several cows had been lost on this farm, and others were sick. An investigation showed the presence of anthrax infection. At

this time three cows had high temperatures (104° to 106° F.) and were manifesting severe symptoms of the disease. Twenty c.c. of globulin prepared from serum 48 were administered intravenously to each of the three animals. One of the animals was in a dying condition at the time the injection was made, and died shortly afterwards. The next morning a decided drop in temperature was noted in the two other animals. Another injection of 20 c.c. of globulin was administered that afternoon. Complete recovery resulted in both cases. Prophylactic treatment was given to 244 head of cattle and twenty-five horses and mules, consisting of injections of 6 c.c. of globulin where that prepared from serum 96 was used, and 4 c.c. of the serum 48 preparation, administered simultaneously with 1 c.c. of a standardised anthrax-spore vaccine. Up to the present time no additional losses from anthrax have been reported in this herd.

The authors summarise the results of their investigations as follows:—

1. Anthrax serum was fractioned by the methods used in the preparation of diphtheria antitoxin. The anthrax antibodies were associated with the pseudo-globulin fraction.

2. The globulin preparations contained the antibodies in a concentrated form. This was shown in numerous tests on laboratory animals. The preparations were likewise potent in tests on larger animals—that is, cattle, horses, etc. When administered to human beings (men) infected with anthrax the globulin preparations were found to have great therapeutic value. However, no data have yet been obtained which permit accurate measurement of the potency of either the serum or the globulin obtained therefrom.

3. The methods of analysis of serum and similar preparations of globulin have been improved by the use of the centrifuge instead of filtration as a means of separating globulin precipitates from their filtrates. The precipitates are obtained in compact form with a minimal amount of absorbed supernatant fluid. There is no need for reprecipitation.

4. The changes in the amounts of the serum proteins in a mule undergoing immunisation to anthrax were similar to those usually noted in the serum of animals being immunised to diphtheria, tetanus, and rinderpest—that is, there was a pronounced rise in the content of the total coagulable protein and total globulin.

5. Favourable results follow the use of anthrax serum or globulin preparations in the treatment of anthrax in man and animals. The globulin preparation is probably superior to the serum in the treatment of the disease in man, since the dose is smaller, and may be safely given intravenously, and the danger of anaphylaxis is minimised.

6. The work on the standardisation of anthrax serum by complement-fixation, while still in an experimental stage and incomplete, points to the possibility of a more accurate means of standardisation through its employment.

THE SEPARATION OF SERUM INTO COAGULATIVE AND NON-COAGULATIVE FRACTIONS. A. F. HESS. *Journ. Exp. Med.* Vol. XXIV., No. 6. December 1916. Pp. 701-708. 6 Tables.

The fact that the coagulative principle of serum is closely associated with the euglobulin fraction of the blood is of clinical as well as theoretical interest. It affords the possibility of preparing a haemostatic containing 2 per cent. of protein which is more potent than the whole serum containing 6 to 7 per cent. of protein. A preparation of this kind has been made from horse serum and employed in numerous cases of bleeding. This euglobulin is absolutely sterile, as it has been passed through a Berkefeld filter, and is safeguarded against decomposition by the addition of 0·3 per cent. tricresol.

The method of the preparation of the euglobulin is as follows:—The horse serum is diluted with one-half of its volume of water, and then the euglobulin is precipitated with a 30 per cent. ammonium sulphate solution. A small amount of pseudo-globulin comes down in the course of the process. The ammonium salt is then added up to 54 per cent. to carry down the pseudo-globulin, after which enough is added to the filtrate to precipitate all the albumin.

THE MECHANISM OF THE AGGLUTINATION REACTION. H. PRIESTLEY. *Journ. Hygiene.* Vol. XV., No. 4. February 1917. Pp. 485-504. 15 Tables.

The author comes to the following conclusions:—"The agglutination and precipitin reactions are probably essentially the same in nature. The agglutination of bacteria by specific sera is probably due to the formation of altered serum protein in and around the bacteria, and the consequent flocculation, by electrolytes, of this altered protein and the bacteria. This altered protein is probably altered serum globulin, and possibly other altered serum proteins. The phenomenon of inhibition, exhibited by heated agglutinating serum, resembles closely the inhibition of agglutination by acids and alkalies. The inactivation of agglutinating serum by heating at temperatures between about 60° and 72° C., and the production of 'zones of inactivation,' are probably due to the development of inhibitory substances and not to the destruction of the agglutinin."

SURGERY.

SPAYING OF BOVINES IN ARGENTINA (La castration des femelles bovines en Argentine). S. COLLAS and R. SAINT-CALBRE. *Rec. Méd. Vét.* Vol. XCIII, Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 58-63.

The animals presented for castration are usually bred directly from the shorthorn or Hereford bull and the native cow. They are three to six years old, as a rule, and in rather poor condition. A few heifers are spayed through the flank. They have all retained their full liberty from birth, and are therefore unapproachable without proper means of restraint. Corraled in groups of forty to sixty, they are driven one at a time into a kind of stocks, in which the head is seized and immobilised by an ingenious contrivance. The limbs are free, but little lateral movement is possible. Five assistants enable an expert operator to work with extraordinary rapidity. One assistant takes up a position above the animal and keeps the tail elevated during the operation. Cows are spayed *per vaginam* by means of an ordinary chassaignac ecraseur, provided with spare chains, and an ovariotomy knife. These instruments, together with some sponges, are well boiled in a 3 per cent. solution of lysol before the day's work begins, the hands and arms are thoroughly disinfected, and both hands and instruments are rinsed in an antiseptic solution after each operation. Two pails, one containing water, the other a weak solution of lysol, are used to wash the vulva and surrounding parts. The washing is, however, carried out in a very perfunctory manner, occupying only ten to twelve seconds, whilst the contents of the pails, changed every ten to fifteen cows, become very dirty.

Technique.—The operator, suitably booted and clothed, with his right hand removes the vaginal mucus, and punctures the anterior vaginal wall two fingers' breadth above the os. The left hand is then introduced, the fore and middle fingers of which enlarge the incision and seize the ovary, usually the right, drawing it into the vagina. With the right hand the operator now grasps the ecraseur, passes the chain above the ovary, slackening the chain whilst pushing against the handle with his chest. The ovary is then cut off very quickly; average time four to six seconds. Without removing the left hand, the left ovary is similarly dealt with. The hand containing the two ovaries is withdrawn, and, without any washing, the animal is immediately set at liberty and commences to graze. The cow seldom moves during the operation, and any arching of the back is at once checked by a slight blow on the nose. The average time between the introduction of the hand into the vagina and its withdrawal with the two ovaries

is rather less than 1½ minutes. As a rule, twenty to twenty-two castrations are performed per hour. In one day (eight to ten hours) the operator castrated 175 cows and eleven heifers.

Only two accidents are recorded, both cases of double radial paralysis from injuries inflicted in the "stocks." One cow recovered within an hour, the other was slaughtered after twenty-four hours. At the autopsy, a small lacerated wound was found in the uterus and a large blood-clot in the pelvis. One death occurred, attributed to the animal's very poor condition at the time of operation. The large number of spayed cows appeared to suffer no ill effects; on the contrary, their general condition rapidly improved, whilst the mortality was practically nil. These satisfactory results are ascribed, apart from the remarkable dexterity of the operator, to the simplicity of the means of control, the rapidity of the operation, and the open-air life in the favourable climate of Buenos Aires.

(A. W.)

OOPHORECTOMY FOR NYMPHOMANIAC AND TICKLISH MARES. G. A. ROBERTS. *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. Pp. 145-147.

The reasons adduced for performing the operation are: (1) The exceedingly unpleasant annoyance caused by nymphomaniac and ticklish mares. (2) The animal is often dangerous or useless. (3) Such afflicted animals are often handled in a brutal and inhuman manner. (4) Practically all such mares are sterile.

Seeing that small lesions of the female sexual organs frequently produce marked symptoms of nervous disturbance, the author reasoned that the logical treatment is oophorectomy. Though he has seen clitorectomy performed he could not see much logic in the operation. In his opinion and experience a cystic condition of the ovary is the common cause of the condition of nymphomania. In only one mule of the thirty-four animals upon which the writer has operated did he fail to find one or both ovaries with conspicuous cysts. In this mule the ovaries were under-sized, and the cause of the ticklishness is set down to hypersensitiveness.

The details of the operation are given. Latterly the author has used a local anaesthetic for the vaginal incision and the mesovarium, injected by a small cocaine syringe with a short dental needle.

PITFALLS IN THE WILLIAMS' OPERATION FOR POLL EVIL. J. V. LACROIX. *Amer. Journ. Vet. Med.* Vol. XII., No. 2. February 1917. Pp. 84-86.

The radical operation for the cure of poll evil, with which is associated the name of W. L. Williams, consists in the resection of the

ligamentum nuchæ and other diseased structures through a long incision in the median line. Whilst this operation is the most practical method of treating poll evil, care must be exercised in certain *atypical* cases in which there is little swelling and little or no formation of new tissue. Here the amount of necrotic tissue is limited, and the discharge of pus, during the quiescent periods, slight. Nevertheless the radical operation is indicated, and may be performed without hesitation. The author discusses and criticises four points in connection with the technique: *First.* For the control of hæmorrhage artery forceps and the actual cautery possess certain disadvantages; one relies mainly on completing the operation as soon as possible, and packing the wound cavity with gauze or cotton-wool wrapped in gauze. Large vessels may be seized with the forceps. *Second.* Pressure over the atlanto-epistrophic (axial) space is liable to occur when the wound cavity is too tightly packed, or when the packing absorbs a quantity of blood. The symptoms of pressure on the spinal cord may be alarming; and they are most likely to be manifested in those atypical cases in which there is no dense tissue over the (superior) atlanto-axial ligament. The operator may determine to some extent the amount of this tissue by noting the resistance imparted to the finger. Pressure symptoms may appear immediately the horse comes out of the chloroform. In other, more or less typical, cases inco-ordination of movement is observed when the tight packing has been left *in situ* for twenty-four hours. In both classes of cases (atypical and typical) the symptoms disappear more or less quickly with the removal of the cause. Prevention consists in elevating the packing with a pair of forceps immediately after its insertion, and again fifteen or twenty minutes after the completion of the operation. In exceptional instances, pressure symptoms have occurred intermittently, owing to the formation of dense tissue over the ligament. *Third.* It is not necessary or advisable to remove any bone from the crest of the occipital bone for purposes of drainage, as practised by Williams. Drainage is secured by feeding the animal off the ground. *Fourth.* Partial resection of the ligamentum nuchæ may be carried out when the necrosis of the ligament is limited in extent and the muscular tissues are little, if at all, affected. Nevertheless all portions of the resected ligament must be removed from the occipital attachment, so that there may be no obstruction to drainage. The ligament on the sound side may be left intact.

(A. W.)

VENTRICULECTOMY AND RESECTION OF THE MIDDLE PORTION OF THE VOCAL CORD, WITH SIMULTANEOUS TUBING OF THE LARYNX AND TRACHEA (Ventriculectomie et résection de la portion moyenne de la corde vocale. Tubage laryngo-trachéal immédiat).

A. COQUOT. *Rec. Méd. Vét.* Vol. XCIII., Nos. 1-2. 15th January 1917. Pp. 6-15. 4 Figures.

The question of chronic roaring has long engaged the attention of veterinary surgeons; in the French Army it has become more pressing since the outbreak of war owing to the presence of a large number of roarers. Some of these horses were purchased by special commissions without being previously tested; others developed the disease after importation as the result of respiratory affections, and were drafted to the front too soon, only to be sent back on account of chronic roaring.

Such animals have been variously dealt with: cast, moved about from one dépôt to another, or subjected in hundreds to Williams' operation according to the fancy of the commanding officer, or the willingness or ability of the veterinary officer to adopt radical measures. The author seeks to encourage doubtful and timid surgeons to have recourse to what is undoubtedly a simple operation, within the reach of all, which should be performed in all chronic cases located in the larynx.

With the idea of avoiding post-operative *contretemps*, particularly œdema of the glottis, and wrinkling or projection of the vocal cord during the period of cicatricial contraction, the insertion in the larynx of a special tube immediately after the operation, together with the excision of a portion of the vocal cord, are recommended. The classic technique is modified or supplemented in these respects; otherwise the stripping of the ventricle is performed in the usual manner.

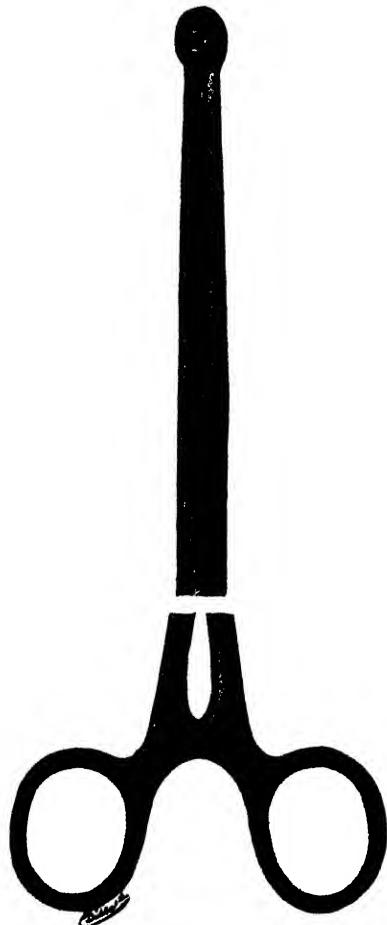
A description of the anatomy and physiology of the larynx is followed by the history of the various surgical measures for the relief of roaring, mainly to show the importance attached by former experimenters to the vocal cord. Thus Günther (of Hanover), who led the way in 1845, tried successively: (1) Resection of both vocal cords. (2) Removal of the cord on the paralysed side. (3) Ablation of the cord and ventricle on the same side. (4) Partial or total excision of the arytenoid. (5) Fixation of the arytenoid to the thyroid. In 1889 Möller in Germany, and Fleming in England, commenced their researches. Non-success with other methods led Möller to practise complete excision of the arytenoid cartilage, while Fleming, whose experience dated from 1878, came to the conclusion that the persistence of roaring in horses in which the arytenoid had been removed was due to the vocal cord. Consequently, Fleming excised both cord and cartilage. Moussu held the same opinion as Fleming.

Although arytenoidectomy has fallen into disrepute, the author recalls the interesting fact that Günther actually practised removal of the vocal cord with the corresponding ventricle as early as 1865.

Technique.—The ventricle-stripping operation of Williams may, if

necessary, be performed without a special instrument; the latter is not indispensable. The usual methods are: burrs, toothed forceps, metallic thimbles, cauterisation or removal of the sac. The author recommends and uses burr-toothed forceps (see Fig.), but gives no details as to their employment. They evidently combine the advantages of the burr and

the toothed forceps, and are intended to seize the mucous membrane at the bottom of the pouch; the rotation and twisting of the instrument during its gradual withdrawal serves to detach the whole mucous lining, and to pull it out inverted.



Vocal Cord.—The question is asked: "What becomes of the vocal cord during the healing process?" The arytenoid is gradually drawn outwards from the middle line until it is laid flat against the wing of the thyroid; but the vocal cord follows this outward movement only passively and imperfectly; it constitutes a dead weight which the contraction of the new cicatricial tissue has to overcome. During its outward displacement the vocal cord may become wrinkled and project into the glottis, interfering with the passage of air. For these reasons, the author, after removing the ventricular lining, proceeds to excise a square piece 10 to 12 millimetres from the middle of the cord with forceps and straight scissors. The wound in the cord is left unsutured.

The stripped ventricle is now well exposed, and any portion of mucous membrane which may have escaped is easily detached. Partial excision of the cord, it is claimed, throws less strain on the process of cicatricial contraction and adhesion, which thus proceeds more rapidly and completely; whilst the cord is shortened and soon heals without any wrinkling or folding.

Ventriculectomy is performed on both sides, both arytenoids having been found paralysed in all cases; the vocal cord, however, has only

been partially excised on the left, the side showing the most paralysis. The right vocal cord may be similarly treated if the right side is much affected.

Tubing the Larynx.—Immediately after the operation the insertion of a temporary tracheotomy tube in the laryngeal opening is strongly advocated. The cannula of this tube passes into the trachea and rests on the anterior border of the cricoid, whilst the shield has its anterior or upper edge folded over to avoid cutting or bruising the skin. The upper portion of the tube is also maintained in position by sutures. Cœdema of the glottis is a somewhat rare sequel, at anyrate in well-bred horses; but the impossibility of foreseeing cœdematous accidents, their sudden appearance, and the urgent need of an operation to avoid asphyxia point to the systematic use of the tube in all cases as a precautionary measure. The sutures necessary to keep the tube in its place are also said to hasten the healing of the laryngeal wound. These sutures are removed about the 4th or 5th day.

The operation, modified as already described, gave very satisfactory results in 1913 and in the early part of 1914. These results, the author freely admits, might possibly have been obtained by merely stripping the ventricle, but this hypothesis cannot be proved.

It has not been found possible to keep a record of horses operated on since the war.
(A. W.)

URETHRO-CUTANEOUS SUTURE IN THE AMPUTATION OF THE PENIS OF THE HORSE (La suture uréthro-cutanée dans l'amputation du pénis chez le cheval). M. CHARMAY. *Rec. Méd. Vét.* Vol. XCIII, Nos. 1-2. 15th January-15th February 1917. Pp. 16-18. 2 Figures.

It is important to practise the urethro-cutaneous suture in a proper manner in order to effect a complete cure. The prevention of stricture, and therefore the success of the operation, depends on complete coaptation between the mucous membrane of the urethra and the skin.

Before casting, inject 20 centigrammes (3 grains approx.) of the hydrochloride of cocaine under the skin of the perineum at the level of the sciatic (ischial) arch. This anaesthetises the penis as completely as possible. The length of the wound, along each side of which the sutures are inserted, should be at least 8 to 10 centimetres; it may be longer with advantage. Interrupted sutures single or double are only advisable when placed very close together, and they require time for their insertion. Hence the quick, continuous Glover's suture is recommended to bring about an intimate union of the tissues, together with

Reverdin's special needle and No. 2 or No. 3 silk. This needle is mounted in a handle, and has a movable eye near the point; it is also curved laterally, right or left. Commence at the upper border of the wound, exert suitable traction on the thread, and pass the needle at intervals of 1 centimetre ($\frac{3}{8}$ in. approx.) from without inwards so as to make as small an opening as possible in the urethral mucous membrane. There must be no slack stitches, nor can the strength of the thread always be trusted. If the latter gives way or cuts through, separation of the mucosa and skin takes place, with stricture as a very probable sequel. Hence, to obtain additional security, insert three interrupted sutures on each side at the upper part of the wound where perfect union must be obtained.

Horses which have had the urethra stitched in this manner have shown no signs of stricture, as far as it has been possible to keep them under observation.

(A. W.)

THE TREATMENT OF WOUNDS BY THE POLYVALENT SERUM OF LECLAINCHE AND VALLÉE (Le traitement des plaies par le sérum polyvalent des professeurs Laclainche et Vallée). A. GUILLAUME and G. BITTNER. *Rev. Gén. Méd. Vét.* Vol. XXVI., Nos. 302-303. March 1917. Pp. 67-79.

In the treatment of numerous infected wounds of all kinds, the authors have found that the use of chemical antiseptics has not always given the good results which might have been expected. Often, with the greatest care, it has been difficult to produce healing, and sometimes, whatever the antiseptic employed or the surgical intervention practised, the lesions have become aggravated.

Since the introduction by Leclainche and Vallée of a polyvalent serum the authors of the present paper have tried it in a number of cases, preferably in grave conditions which could not be cured by more customary methods. They now give the results obtained in a selection of cases including wounds produced by harness, fistulous wounds produced by projectiles, wounds of joints, gangrenous dermatites of the extremities, and ulcerative wounds of lymphatics.

Inflammatory symptoms quickly disappear under the treatment. Pus becomes less in amount and devoid of odour, and is soon replaced by a serosity which coagulates at the edge of the wound. The temperature returns to the normal. Reparative processes are stimulated and cicatrisation is effected without deformity.

The authors express themselves as never having had such happy curative effects with either antiseptics or the preparations recently introduced.

THE TREATMENT OF SEPTIC WOUNDS WITH BISMUTH-IODOFORM-PARAFFIN PASTE. LOUISA GARRETT ANDERSON and HELEN CHAMBERS. *Lancet.* Vol. CXCII., No. 4879. 3rd March 1917. Pp. 331-333. 1 Table.

There is abundant evidence that opinions differ respecting the best means of combating bacterial infection of wounds.

Rutherford Morison (*Lancet*, 12th August 1916) has called attention to the value of a paste made of bismuth, iodoform, and paraffin, known for brevity as B. I. P. P. The following is the formula:—Iodoform 2 ozs., bismuth subnitrate 1 oz., and liquid paraffin q.s. Any consistency may be made, but the most useful are those of soft butter and thick cream.

Gangrenous and necrotic tissue is cut away and the wound thoroughly cleaned. It is then swabbed out with rectified spirit, and a small amount of the paste rubbed into the tissues. A little paste is left in the depths of the wound, which may be closed with interrupted stitches. It is said that no further dressing is required for seven to fourteen days. Too much paste must not be used for fear of toxic absorption.

The advantages claimed for the paste are: (a) It maintains a continuous antiseptic action in the wound; (b) it acts as a lymphogogue, and a free exudation of serum washes the wound from within outwards; (c) it does not prevent the escape of discharge; (d) granulation tissue grows freely in contact with it; (e) drainage tubes and gauze dressings are unnecessary; (f) septic wounds heal nearly as rapidly as non-infected ones; (g) bone union is rapid and the tendency to form sequestra is slight.

AUTO-DISINFECTION OF WOUNDS BY THE USE OF ETHER SOLUTION.
A. DISTASO and T. R. BOWEN. *Brit. Med. Journ.* No. 2930.
24th February 1917. Pp. 259-261.

The treatment of infected wounds by sterilisation, either by disinfectants or vaccines, is not, in general, regarded as yielding satisfactory results. The writers of this communication have employed a method based on the known bactericidal property of fresh young tissue, as was demonstrated by Maffucci (*Revista critica clin. med.*, 1900, No. 12) in the case of embryonic tissues of chickens and the tubercle bacillus. Their aim was to produce such embryonic tissues in wounds by "quickening" the process of regeneration. Ether was selected on account of its marked stimulating power.

The results with undiluted ether were disappointing; but a series of cases irrigated with a 2 per cent. solution gave good results. It

should be noted that a 2 per cent. solution of ether is not inimical to the growth of microbes.

In another series of cases the method of irrigation was replaced by one of immersion of the wound in a 2 per cent. solution of ether for twenty minutes once a day; and, in the opinion of the authors, the immersion method is even more efficient than irrigation. From this it is evident that the stimulus applied is the cause of the rapid growth of granulation tissue and the forced healing of the wounds.

Sections of granulations from wounds were made during the course of the treatment. It was found that the regeneration of tissue takes place normally. The most striking feature was the marked production of fibroblasts. New blood-vessels were very richly distributed and quickly formed in the deep layers. Sections stained by Gram's method and fuchsin showed no microbes of any kind. The total absence of fibrin was another striking feature in the sections.

The ether method has proved its ability to quicken the healing of wounds, and the treatment of a case is completed in about half the time taken before its introduction into the practice of the writers.

IMPORTANT PRINCIPLES IN THE DRAINAGE AND TREATMENT OF WOUNDS.

W. PEARSON. *Lancet.* Vol. CXCII., No. 4882. 24th March 1917. Pp. 445-449.

After experience of the treatment of several thousand cases of wounds Major Pearson is convinced that the value of saline solutions and antiseptics as aids to disinfection is doubtful and negligible. Their use in no way diminishes the necessity for free mechanical drainage. Vaccines are not helpful in dealing with infections in wounds of war.

Efficient mechanical drainage is an essential factor in the successful treatment of infection. The cardinal principles governing drainage are: freedom of exit, gravity, capillary action. Drainage tubes should not be employed unnecessarily. They should effect the purpose for which they are used, and should not act injuriously in the wound. Dressings should not be tight, of close texture, or waterproof. They should be exposed to the air while the discharge is profuse. Continuous irrigation aids disinfection by mechanical removal of discharge. It is not usually feasible when dealing with a large number of cases. It is not necessary to obtain good results.

Free administration of fluids to the patient is an important adjunct in the treatment of sepsis. Rest is an important factor in wound treatment and should never be neglected.

Most of the complications and sequelæ of infection are due primarily

to inefficient mechanical drainage, and are therefore preventible. Delay in healing is almost invariably due to local mechanical causes.

A COMPARATIVE STUDY OF VARIOUS ANTISEPTIC AGENTS (Sur la prophylaxie de l'infection des plaies de guerre. Étude comparée de divers agents antiseptiques). H. VINCENT. *C. R. Acad. Sci.* Vol. CLXIV, No. 3. 15th January 1917. Pp. 153-156.

In 1894 (*C. R. Acad. Sci.*, vol. cxix. p. 965) Vincent made an investigation of the bactericidal action of a large number of disinfectants, and found that hypochlorite of calcium and sulphate of copper were the most efficacious. In 1896 he repeated his observations from the surgical point of view and showed the very great efficacy of hypochlorite of calcium in the curative treatment of septic complications (*Le Caducée*, 15th April 1905; *La Presse Méd.*, 8th October 1914, p. 642).

It now appeared desirable to renew these investigations, taking the point of view of *preventive* disinfection. Because of convenience and simplicity in use a dry powder seemed best. Consequently, fluoride of sodium, formate of sodium, chloride of zinc, hypochlorite of calcium, boric acid, borate of sodium, sulphate of copper, sulphate of iron, permanganate of potassium, and iodoform were tested. Except in the cases of iodoform, boric acid, and borate of sodium the antiseptic was diluted to the strength of 10 per cent. by mixture with some inert powder or other.

Iodoform, sulphate of iron, boric acid, borate of sodium, permanganate of potassium, and formate of sodium were shown not to be sufficiently effective in the destruction of germs. Chloride of zinc was better and caused a diminution in the number of organisms at first. Later, however, the number of organisms increased. Chloride of zinc is caustic. Sulphate of copper is an active agent, but toxic. Fluoride of sodium is also active, but possesses a certain degree of toxicity.

Hypochlorite of calcium was shown to be a very powerful antiseptic, but it must be diluted with some powdered substance. Vincent concludes that the following formula gives the most active and easily preserved dressing:—

Fresh hypochlorite of calcium (titrating 110 of Cl) . . . 10 parts.
Boric acid crystals, powdered and dry 90 "

Powder the two separately, then mix and keep in a coloured bottle.

Freely applied, this dry dressing prevents the infection of wounds.

SECTION SUTURE AND REGENERATION OF NERVES (*Sur la suture des nerfs. Note Préliminaire*). A. FROUIN. *C. R. Soc. Biol.* Vol. LXXIX., No. 20. 16th December 1916. Pp. 1140-1142. (*Contribution expérimentale à l'étude des sections et restaurations nerveuses.*) E. DUROUX and A. COUVREUR. *La Presse Méd.* No. 69. 14th December 1916. Pp. 572-574.

The note by Frouin relates the results of experiments on the suture of nerves at different periods after section. Suture immediately after section of the sciatic nerve of dogs resulted in a rapid return of motor function. In only one animal was there any trophic trouble. The results point to the advantage of early suture.

The experiments of Duroux and Couvreur, also made on dogs, lead to somewhat different conclusions. These writers were driven to assume that *immediate* restoration of function after suture of a sectioned nerve is merely illusory. Real restoration takes place only after a long interval, and true scientific proof of such restoration is difficult. The peripheral segment of the nerve regains its function only when it has been penetrated by the axons from the central segment. In complete section suture is necessary, or even grafting if there has been much loss of nerve tissue. If the nerve is compressed by cicatricial tissue it is necessary to liberate it.

TERATOLOGY.

CONGENITAL MAMMARY FISTULÆ IN THE COW (*Note sur les fistules mammaires congénitales chez la vache*). FRÉGER. *Rec. Méd. Vet.* Vol. XCIII., Nos. 1-2. 15th January-15th February 1917. Pp. 27-28. 2 Figures.

These fistulæ, which are to be distinguished from those of traumatic origin, always occur, in the author's experience, on the postero-internal aspect of a hindquarter, where they functionate as accessory teats. One or more milk canals, which normally should communicate with the lumen of a teat, open independently to the exterior.

They usually pass unnoticed till the first parturition, when an escape of milk draws attention to their existence. An attempt should then be made to lead the milk by an artificial opening into the neighbouring teat, or to stop the secretion by iodin injection. The fistula may be sutured with horsehair, which causes early stoppage of the milk and subsequent atrophy of the gland tissue. (J. P. R.)

TOXICOLOGY.

SO-CALLED STAGGERS IN HORSES CAUSED BY THE INGESTION OF *PTERIS AQUILINA*, THE COMMON BRACKEN. S. HADWEN. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 6. February 1917. Pp. 702-704.

During last winter many horses died from what farmers have been in the habit of calling "stammers." The disease is characterised by uncertain gait, loss of equilibrium, and general unthriftiness, but no loss of appetite. The cases were found chiefly along the banks of the Frazer and on Vancouver Island. It has been proved experimentally that the disease is caused by eating the common bracken, and is usually brought about in the following manner:—Bracken is found in great amount in the province, especially on newly cleared farms. Very ferny hay may contain as much as 30 per cent. of bracken. During the severe winter weather the horses were confined indoors for long periods; hay was scarce, with the result that the animals ate the bracken in the fodder, which otherwise they would have rejected. The cases all occurred where the horses had little else than hay. Where roots, bran, and oats were fed with hay no cases were reported. The amount required to bring on "stammers" was found to be 5 to 6 lbs. per day for thirty days.

Treatment.—Warm bran mashes and roots; elimination of all bracken from the hay; keep the animals warm and as quiet as possible.

(G. H. G.)

LIFE HISTORY AND POISONOUS PROPERTIES OF *CLAVICEPS PASPALI*.
H. B. BROWN. *Journ. Agric. Res.* Vol. VII., No. 9. 27th November 1916. Pp. 401-406. 1 Plate (6 Figures), 2 Text-Figures.

Paspalum dialatum Poir. has attained considerable prominence as a forage grass in the south, but one objection to its use is that forage poisoning frequently results. It has been shown that this poisonous property is due to *Claviceps paspali*, a fungus that infects the grass. The author has made a study of the life history of this fungus, and its growth and distribution in the region near the Mississippi Agricultural College. The fungus infects at least 90 per cent. of the grass heads. Sclerotia produced in the summer and autumn drop to the ground when the old grass head sheds its spikelets. In the May following they germinate.

Drawings and photographs illustrate the paper, which fully describes the life-history of the fungus and method of infection. The fungus is

poisonous to cattle, producing a peculiar nervousness, and, when eaten in large quantities, death.

(G. H. G.)

PRELIMINARY REPORT ON THE RELATION OF ANAEROBIC ORGANISMS TO FORAGE POISONING. J. S. BUCKLEY and L. P. SHIPPEN. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 809-816.

Investigations into the etiology of forage poisoning or cerebro-spinal meningitis are of considerable importance. The symptoms are similar to those of meat poisoning, and it is probable that there are different etiological agents. The exciting cause is found in foods undergoing fermentation.

Shippen was of the opinion that forage poisoning simulated botulism or sausage poisoning in man. With this idea he investigated two strains of *B. botulinus*, one of which originated from certain cheese which had caused the death of several people. This strain proved to be intensely toxic to small experimental animals. Subsequently a four-day old anaerobic culture, grown in a modified Rideal Walker broth, was poured upon oats and fed to a colt. This animal died on the second day, and the post-mortem findings are recorded by the authors. A culture grown aerobically, but in symbiosis with yeast, proved deadly when fed on bran to donkeys. Shippen concluded from his work that *B. botulinus* of Nevins and *B. botulinus* of Ermengem are distinct varieties, and that forage poisoning may be caused by a toxin similar to that produced by *B. botulinus*, or even that some cases of forage poisoning may be due to certain strains of *B. botulinus*. Since these experiments the same organism has been grown in a different medium, and has been found equally deadly to small animals, horses, and donkeys. Dogs and chickens were not affected. As Graham and Hinmeberger had already shown that certain chicken droppings were pathogenic to horses, the droppings from these experimental chickens were fed to a donkey, and the animal died two days later. Details of further experiments with this organism are given. In conclusion, it is stated that while the few symptoms exhibited by the donkey and horses that succumbed greatly resembled some of the characteristic symptoms of forage poisoning, and while the post-mortem findings are yet more characteristic of the disease, it will require further research to establish a definite relationship to the natural or spontaneous so-called forage poisoning. *B. botulinus* is capable of producing a form of forage poisoning should conditions exist in nature for the development of the organism and the elaboration of its toxin as on pastures or in masses of food material. Symbiosis is probably the rule rather than the exception in the development of anaerobes in nature.

(R. G. L.)

TUBERCULOSIS.

THE VIRULENCE OF MUSCLE AND APPARENTLY HEALTHY LYMPH GLAND
IN GENERALISED TUBERCULOSIS OF THE OX AND PIG (Recherches
sur la virulence du muscle et des ganglions apparemment sains
dans la tuberculose généralisée du bœuf et du porc).
P. CHAUSSÉ. *Ann. Inst. Pasteur.* Vol. XXXI., No. 1. January
1917. Pp. 1-18.

Though a considerable amount of work has been done on this subject, Chaussé is of opinion that more precise information is needed. He objects to conclusions arrived at from ingestion experiments, because he has found that even the guinea-pig very often escapes infection by this method. Objections also attach to other methods which have been employed by former investigators.

To test the virulence of muscle very small pieces were taken, after precautions to exclude external contamination, and ground up with sterile sand and a little water. Two or three c.c. of the liquid thus obtained was inoculated subcutaneously into guinea-pigs. Apparently healthy lymph glands were treated in the same way.

In no instance was inoculation with muscle followed by tuberculosis; but the experiments with apparently healthy gland resulted in the production of tuberculosis in a considerable proportion of animals. Consequently, the author concludes that the consumption of the muscle of animals affected with widespread generalised tuberculosis is not attended with danger. On the other hand, the consumption of apparently healthy lymph glands is attended with danger unless the glands are sufficiently cooked. Chaussé holds, therefore, that the French authorities were justified in recently granting permission for the consumption of meat from tuberculous animals after removal of the glands and sterilisation.

A FURTHER REPORT OF THE DIAGNOSIS OF OPEN CASES OF TUBERCULOSIS.
D. H. UDALL and R. R. BIRCH. *Cornell Veterinarian.* Vol. VII.,
No. 1. January 1917. Pp. 13-29.

The authors consider that measures for the suppression of tuberculosis have hitherto been directed against known cases of infection, while the protection of healthy animals against unknown spreaders of the disease has been neglected. The experimental work described in this paper has been conducted for the purpose of demonstrating the failures no less than the accomplishments of diagnostic methods for the recognition of open cases of the disease or "spreaders." To successfully combat the disease

it is highly desirable that there be exact knowledge of the relative value of each method of diagnosis, and that it should be known under what conditions failure may occur.

Without detracting from the importance of fresh air, sunlight, and cleanliness, the authors are of opinion that dependence upon their efficiency has resulted in a false sense of security and contributed to the spread of the disease. Exchange of the older custom of individual segregation for atmospheric improvement has not contributed to the suppression of the disease.

In 1911 a small experimental herd, consisting of reactors and non-reactors, was established at the Experimental Farm of the New York State Veterinary College, where the animals were closely associated with each other. A brief summary of observations up to January 1917 is given. About 50 per cent. of the herd have been condemned, and about one-third of the remaining animals were tuberculous in January 1917. A large percentage of tuberculous animals were condemned within two years after admission on a physical examination, or as non-reactors from the non-tuberculous group.

Susceptible animals acquire the infection in a comparatively short time after exposure. Previous non-reactors became reactors at an average of one and a half years, so that the period of incubation must have been considerably less. The experiment indicates that young animals are more susceptible to infection. A large percentage of tuberculous animals developed into open pulmonary cases.

A comparison of the different diagnostic methods shows that all are far from perfect. The value of each is purely relative, and increases when used in combination with other methods. The real value of the sputum-cup is yet to be established; it is evident that the cow must become a spreader before recognition by this method is possible. Physical examination alone is a failure in the suppression of tuberculosis. It reduces the number of spreaders in a badly-infected herd but it cannot be made to remove all, or nearly all.

THE INCIDENCE OF BOVINE INFECTION OF TUBERCULOSIS IN EDINBURGH.
CHUNG YIK WANG. *Edin. Med. Journ.* Vol. XVIII., No. 3.
March 1917. Pp. 178-196. 9 Tables, 3 Diagrams.

The material for this study was obtained from the Royal Hospital for Sick Children and the Royal Infirmary, Edinburgh, and consisted of post-mortem material from twenty children, ranging from one to fifteen years of age. When the investigations of previous workers are included, the bacteriological examination of 281 cases of various clinical forms of tuberculosis in Edinburgh resulted in the isolation of the bovine tubercle bacillus in 78·4 per cent. of cases under the age

of five years; in 70·3 per cent. between five and sixteen; and in 7·8 per cent. over the age of sixteen years. Abdominal tuberculosis and tubercular meningitis are together responsible for about 90 per cent. of the summed mortality from tuberculosis in children under one year, and about 75 per cent. in children between one and five years. The material from nine children dead from these two diseases was examined bacteriologically, and from six the bovine type of tubercle bacillus was isolated.

From the prophylactic point of view any measure resorted to in combating the disease should be directed not only against the human spread of infection, but also, and more particularly in the case of children, against the bovine source of infection.

It should be stated that the material used in the investigation was from children of the poorer classes. The results, therefore, should not be held as strictly applicable to the community in general, or as representing the conditions prevailing in other localities where the environment may be widely different.

ON THE FORMATION OF GIANT CELLS IN TUBERCULOSIS (Note sur la formation des cellules géantes dans la tuberculose par caryo-anabiose). A. GUIEYSSÉ-PELLISSIER. *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 187-189.

The author has had the opportunity to study sections of tuberculous glands taken from an experimental guinea-pig, and has therein been able to follow the development of the giant cells from their first appearance. The arrangement of the nuclei in a circular group, so characteristic of the tuberculous cell, is a secondary phenomena and appears in old cells. In the manner of its formation the giant cell of tuberculosis is absolutely like those cells which the author has already studied in connection with the introduction of foreign bodies into the tissues.

The nuclei of giant cells are formed by the absorption of nuclei or fragments of nuclei of polynuclear leucocytes by macrophages. Once absorbed, the chromatin reforms a nucleus after a manner comparable to that of the male pronucleus after the spermatozoon has penetrated the ovum. The macrophages, after absorption and reconstruction of the nuclei, become giant cells.

VACCINATION AGAINST BOVINE TUBERCULOSIS (La vaccination des bovidés contre la tuberculose). A. BRUSCHETTINI. *Rev. Path. Comp.* No. 131. February 1917. Pp. 5-6.

A vaccine is prepared by injecting virulent bovine bacilli (washed in a mixture of alcohol and ether to remove the fat) into the pleural

cavity of rabbits. The bacilli are thus left in contact with leucocytes for about forty-eight hours. They are then collected, carefully ground up with quartz powder and emulsified in an agitator with 0·5 per cent. phenol solution. After the addition of ether the mixture is filtered through wadding and preserved under toluol in a refrigerator.

The result of vaccination of eight calves is given. Of these five were vaccinated subcutaneously, three intravenously. Six months after vaccination the calves were inoculated with tubercle bacilli—four of them with a culture, the other four with an emulsion of mammary tuberculosis extremely rich in bacilli.

The method has been so satisfactory that a commission, consisting of Professor Bertarelli of Parma, and Professors Belfanti and Stazzi of Milan, has recommended a practical test on a large number of animals under natural conditions.

OBSERVATIONS BEARING ON THE POSSIBILITY OF DEVELOPING AN EXPERIMENTAL CHEMOTHERAPY OF TUBERCULOSIS. P. A. LEWIS. *Bull. Johns Hopkins Hosp.* Vol. XXVIII., No. 313. March 1917. Pp. 120-124.

From the time of the discovery of the bacillus of tuberculosis, Koch and others succeeding him endeavoured to effect the cure of experimental tuberculosis in animals. The earlier experiments naturally rested in large part on an empirical basis, and the materials chosen were naturally those that had some reputation as active agents in the treatment of human tuberculosis. Koch proceeded on the assumption that, if substances could be found with the ability to check the growth of the tubercle bacillus in artificial cultures, there might be those among them which would check the growth of the organism in the animal body. As the result of his observations Koch states (*Verh. d. X. internat. med. Kongresse*, 1890-91, i., Berlin; *Gesammelte Werke von Robert Koch*, vi. p. 659) that the following substances were especially active *in vitro*: "A number of ethereal oils, among aromatic compounds β -naphthylamin, para-toluidin, xylidin; some so-called tar colours, namely, fuchsin, gentian violet, methylene blue, chinolin yellow, anilin yellow, auramin; among the metals, mercury in vapour form, silver and gold compounds. Gold cyanogen compounds are especially striking in their surpassing activity over all other substances." But he had to admit that "all of these substances remained completely inactive when tested on the tuberculous animal."

After the introduction of Koch's "tuberculin"—upon the therapeutics of which there has been so much controversy—there followed a period of fifteen years during which no observations of any interest

in this field were recorded. The chief result of the scattered work of this period was the recognition that the tubercle bacillus, as compared with other common pathogenic organisms, is difficult to kill with chemical disinfectants.

"The hope, so evidently entertained by Koch, that it would be possible to develop in a rational way specific chemical agents to cure particular diseases (tuberculosis, first of all, in his mind), fulfilled in the most spectacular way by Ehrlich at a time when it had been abandoned as a moving conception in the minds of most workers, has again become a dominating factor in many laboratories where tuberculosis is a subject of study."

The distribution of drugs to the tissues has been the starting-point for a number of recent researches, and for some premature efforts in the treatment of human tuberculosis. Certain anilin dyes, when injected into the living tuberculous animal, become concentrated to a considerable extent in the diseased tissues. Lewis (*Arch. Int. Med.*, 1912, vol. x, p. 68) discovered by experiment that the fibro-caseous tubercle took up the so-called vital stains in a characteristic manner. His experiments seemed to have importance as a basis for further experimental work of a co-ordinated chemical and biological nature. Various compounds of trypan red were made and tested on experimental tuberculosis of the cornea of the rabbit; but in general it was indicated that none of these substances exerted any curative influence on experimental tuberculosis. Some of them, however, seemed to have a definite influence on the vigour and rate of formation of blood-vessels and connective tissue in and around the tuberculous process.

Trypan red being an imported substance, the outbreak of war necessitated a change of plan. It is hoped to repeat the experiments, and to do them in such a way that they may be susceptible of repetition by others.

Other experiments have been conducted with the object of determining the least concentration of certain substances in glycerin-bouillon which will definitely inhibit the growth of the tubercle bacillus. For comparison the typhoid bacillus has been used to determine in the same way the concentration of the substance required to prevent its growth in the same medium. Certain of the observations are briefly recorded in the following tabular statement:—

PHENOL (Carbolic Acid).

<i>Concentration.</i>	<i>Typhoid bacillus.</i>	<i>Tubercle bacillus.</i>
1·800.	No growth.	No growth.
1·2,000.	Good growth.	No growth.
1·4,000.		Good growth.

RESORCIN.

<i>Concentration.</i>	<i>Typhoid bacillus.</i>	<i>Tubercle bacillus.</i>
1-1,000.	No growth.	
1-2,000.	Good growth.	No growth.
1-4,000.	Full growth.	Moderate growth.
1-20,000.		Good growth.

BROWN DYE MADE BY COUPLING BENZIDIN AND RESORCIN.

<i>Concentration.</i>	<i>Typhoid bacillus.</i>	<i>Tubercle bacillus.</i>
1-200.	Moderate growth.	
1-400.	Full growth.	
1-20,000.		Very slight growth.
1-40,000.		Moderate growth.
1-100,000.		Moderate to full growth.

ACRIDIN ORANGE (Dye with Acridin as a Base).

<i>Concentration.</i>	<i>Typhoid bacillus.</i>	<i>Tubercle bacillus.</i>
1-2,000.	No growth.	
1-4,000.	Full growth.	
1-100,000.		Slight growth.
1-200,000.		Moderate growth.
1-400,000.		Full growth.

HELIOTROPE (Kalle & Co.) (a Dye Related to Safranin).

<i>Concentration.</i>	<i>Typhoid bacillus.</i>	<i>Tubercle bacillus.</i>
1-1,000.	No growth.	
1-2,000.	Very slight.	
1-4,000.	Moderate growth.	
1-10,000.	Full growth.	
1-400,000.		No growth.
1-1,000,000.		Moderate growth.
1,2,000,000.		Moderate growth.
1-4,000,000.		Full growth.

The data so far collected make the following general statements possible:—

“(a) Of the analin dyes, this partially specific activity is manifested quite generally by those related to safranin and to acridin. It is shown in greater or less degree by many of the azo dyes made with benzidin as the basic constituent. On the whole, the number of substances showing this property is large rather than small.

“(b) Although in the studies previously made with other bacteria the concentration required to inhibit the growth of the culture is roughly pro-

portional to the higher concentration required to kill the micro-organism in a short period of time, with the tubercle bacillus this is not the case. So far we have discovered no substance by which the tubercle bacillus is killed more readily than is the typhoid bacillus, and while we have used the term 'partially specific disinfectants' in recognition of the work of others along similar lines, it would be more nearly correct to speak of partially specific inhibitors of growth.

"(c) The ability to inhibit the growth of the tubercle bacillus in cultures is not dependent on high disinfectant activity in general, and is an attribute of a number of substances which are relatively non-toxic for higher animals."

TUBERCULOSIS (Tuberkulose und Tierzucht). U. DUERST. *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 2. February 1917. Pp. 65-91. *Ibid.* No. 3. March 1917. Pp. 154-173. 3 Charts.

This paper contains a statistical study of the incidence of tuberculosis, and, among other problems, endeavours to answer the question whether the dust of byres and hay, by irritation of the pulmonary epithelium, affords entrance to the tubercle bacillus.

Statistical statements respecting the frequency of tuberculosis in man and cattle, derived solely from post-mortem findings, can give no information respecting the spread of tuberculosis. The age of the animals in different groups must be taken into careful consideration. As Ehrhardt and Guillebau have already shown, the frequency of tuberculosis increases with age, but only up to a certain point. A curve of average frequency can be constructed from which the true frequency may be calculated if the age-classes of the animals under consideration are known.

From an etiological standpoint, byre-life plays a pathogenic rôle, not only by lowering resistance, but also because of the presence of dust. Furthermore, the larger the byre and the greater the number of cattle brought together the greater is the percentage of animals infected. It is therefore better to build small byres rather than to bring many animals together in one building.

TUBERCULIN HYPER-SENSITIVENESS AS DETERMINED BY INTRACUTANEOUS TESTS OF DIFFERENT DOSAGES. M. SOLIS-COHEN. *Journ. Inf. Dis.* Vol. XX., No. 3. March 1917. Pp. 233-243. 6 Tables.

Hyper-sensitiveness to tuberculin was studied in twenty-eight human patients. In all the cases but two T. R. (tuberculin Rückstand) was injected; the remaining two were injected with old tuberculin.

"Tuberculin hyper-sensitiveness seems to correspond with tuberculin tolerance. The appropriate therapeutic dose of tuberculin is

the dose that gives the minimal reaction when injected intracutaneously. This applies equally well to the initial dose and to any subsequent dose.

"The appropriate therapeutic dose as determined by intracutaneous injection is approximated clinically by increasing the dose until a favourable systemic reaction is produced, then maintaining the dose producing this until it no longer produces such reaction, and then again increasing it.

"The therapeutic value of tuberculin, properly administered, can be seen in the accompanying decrease in hyper-sensitiveness."

REPORTS.

THE HEALTH OF THE PEOPLE: A NEW NATIONAL POLICY. London:
The Argus Printing Co. Pp. 63. 3d.

In February 1914 a committee, consisting of Mr. Stanley Baldwin, Lord Henry Bentinck, Mr. Percy Harris, Col. J. W. Hills, Mr. H. W. Forster, Mr. Leslie Scott, and Major Lord Alexander Thynne, with Major the Hon. Waldorf Astor as chairman, was set up to inquire into and review the administration of public health, with a view to its improvement. The war interrupted the work, but the committee have decided to publish their report though in an unfinished state. The two prime convictions which inform the report are that the care of public health is the duty of public authority, and that there are serious faults in its present fulfilment.

As an instance of the economic importance of the matter, an eminent statistician (whose name is not given) has been asked to give attention to the bearing of tuberculosis on national earning-power. Basing his calculations (made in 1914) upon the case of males alone, he says:—

A conservative estimate of the net ultimate loss due to the mortality from tuberculosis (in England and Wales) in 1911, on the hypothesis that, had those who died survived, they would be subjected to twice the mortality from other causes in subsequent life, is £20,000,000, the sum necessary to be invested at 3 per cent. in order to pay that money as it was wanted being over £12,000,000. Without the assumption of double mortality the figures are £25,000,000 and £14,500,000 respectively. Assuming females to have the value of males in providing life capital in the shape of future wage-earners, the totals for both sexes would be nearly double the above sums.

If it were possible to reduce the mortality of the whole of England and Wales to the level maintained in the aggregate rural districts, the same statistician makes the following financial estimate:—

Assuming that those whose lives would be saved by this reduction are weaklings who would die twice as fast as their fellows in subsequent life the ultimate saving would be £32,000,000 and the present value £14,000,000. If, however, they lived the normal life, the figures would be £41,500,000 and

£17,500,000 respectively. About £7,000,000 per year would be gained by bringing England and Wales into line with the rural districts with respect to the male mortality at ages under fifteen only.

The committee find little difficulty in adducing proof of the hygienic backwardness of the country, and consider that, among other evidences—

A particular and most mischievous instance of procrastination is to be found in the question of a pure milk supply. All schools of opinion are agreed upon the importance of pure milk and on its vital necessity for the well-being of young children. Year after year until 1915 Milk Bills were introduced in a half-hearted spirit by the President of the Local Government Board, only to be checkmated by the opposition of vested interests. This is a typical instance of neglect. . . .

The problem of the milk supply is one of considerable complexity, largely owing to two central departments being concerned on behalf of divergent interests—the Board of Agriculture holding a brief for the producer and the Local Government Board for the consumer. The former has laid down a standard of *quality* for milk; the latter is vigilant in the interests of *purity*—which is not the same thing, though very apt to be confused with it. Then the regulation of dairies is conducted through the Local Sanitary Authority, while the application of the Food and Drugs Acts is in the hands of the County Council. Furthermore, there are a number of private Acts giving certain localities special powers in the supervision of milk. Technically, the above description is of a past state of affairs, for the last Milk Act (1915) has simplified the machinery by co-ordinating action at many points, and has given the Local Government Board far-reaching powers of issuing orders for the regulation of the industry. The application of the Act has been suspended, however, pending the conclusion of the war, since the staffs of the authorities concerned are meanwhile in a too depleted condition to have the inauguration of a new system thrown upon them. When the latter does come into operation there can be little doubt that it will as far as possible concentrate executive powers in the hands of the larger rather than of the smaller local authority. The legitimate concern of the Board of Agriculture must always provide an element of complication in this subject, and a real understanding between it and the central health department will be essential to the securities which the public requires.

Under the existing system the War Office, the Admiralty, the Post Office, and the Ministry of Munitions are incidentally and in a limited sense concerned with public health. Six Government departments, however, exercise public health functions of a general range. These are the Local Government Board, the Insurance Commission, the Home Office, the Board of Agriculture, the Board of Education, and the Board of Trade.

In order to remedy the present diffuse and sometimes conflicting

control of public health the report examines four alternative methods :—

1. All health functions might be concentrated in the Local Government Board ;
2. All health functions might be handed over to the Insurance Commission ;
3. A totally new Department of Health might be created ; or, finally,
4. Some compromise among these courses might possibly be found to offer the best immediate policy.

The creation of an entirely new Department of Health the report considers to be ideally the most attractive proposal ; but it would involve so much undesirable dislocation that the committee have had no hesitation in turning aside from it in favour of the utilisation of the Local Government Board as a basis for a new National Health Department.

ANNUAL REPORT OF PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS, ETC., FOR THE YEAR 1916. Board of Agriculture and Fisheries. 1917. 3d.

The report contains an account of the outbreak of foot-and-mouth disease which occurred in Somerset. This, it is noted, is the only outbreak of the disease which appears in the records for the year under review, as against fifty-six outbreaks in 1915 and twenty-seven in 1914.

Anthrax was confirmed during 1916 in 571 instances, as compared with 575 in 1915. One outbreak affords a striking example of the danger which may arise from skinning an animal which dies suddenly from some unascertained cause. In the case in question anthrax in a milking cow was confirmed on 25th October ; between 23rd and 25th November five more cattle died from that disease, and eight between 14th and 16th December, making fourteen deaths from anthrax in all. Investigations brought to light the fact that a cow which had died suddenly on this farm on 18th July had been skinned in the yard, the carcase being thereafter dragged through the barn and across the rickyard to its place of burial, close to a stream. Between that date and 25th October one horse, one goat, and four calves had died and had been buried in various places near the farmstead. It is now believed that the cow died of anthrax and that all the subsequent deaths were due to that disease, infection having been contracted either by passing over the land over which the cow's carcase had been dragged or from consuming the hay which was stored in the barn.

Apart from the occurrence of the disease among army horses, forty-

seven outbreaks of glanders and farcy were reported, as compared with forty-nine in 1915.

From the number of outbreaks reported it is clear that parasitic mange in horses is on the increase. Sheep-scab also shows a greater number of outbreaks (424) in 1916. In 1915 the number of outbreaks was 257. "Though the set-back in the operations against sheep-scab is disappointing, it is not very surprising, inasmuch as the depletion of skilled labour has naturally resulted in a less careful management of the sheep stock, more especially in remote districts, and circumstances have militated against thoroughly effective sheep-dipping operations."

Though the total number of outbreaks (4331) of swine fever is greater by 337 than it was in 1915, the last quarter of the year showed an improvement of the position which has continued through the earlier weeks of the present year. The outlook, therefore, appears a little more reassuring. An account is given of the present procedure respecting serum treatment and slaughter.

In addition to the usual statistical tables, the appendix to the report contains a list of orders of the board revoked during 1916, and of orders made during 1916 which remained in operation on 1st January 1917.

ACREAGE AND LIVE-STOCK RETURNS OF SCOTLAND: AGRICULTURAL STATISTICS, 1915. Vol. IV., Part 1. 1917. 3d.

The total number of horses of all kinds in Scotland in 1915 was 198,704, and showed a decrease of 10,656 as compared with 1914; in the latter year there was an increase of nearly 5000 as compared with 1913. With the exception of stallions, the number of which was unchanged, horses of all classes were fewer. The largest decrease, both absolute and relative, was in horses used for agricultural purposes, including mares used for breeding.

The total number of cattle in the country in 1915 was 1,223,933, an increase of 8959, or 0·74 per cent. over 1914, and of 25,670, or 2·14 per cent. over the average of the previous ten years. It is noticeable, however, that the net increase is due to the augmented numbers of young cattle under two years, as all other classes—cows, heifers, and cattle of two years and above—were smaller than in 1914.

The increase of nearly 225,000 in the total number of sheep in 1914 was followed by the further gain of practically 50,000 in 1915, the returns for the year amounting to 7,075,798. This increase was notwithstanding a somewhat unfavourable lambing season, which resulted in a fairly considerable reduction in the number of lambs as compared with 1914.

The total number of pigs in Scotland in 1915 was 159,057, an increase of 6289, or 4·12 per cent. on 1914, when there was an increase of 21,000 as compared with 1913. The only occasion within the last thirty years when the 1915 total was substantially exceeded was in 1911, though it was slightly surpassed in 1912 and 1890.

ANNUAL REPORT OF THE DIRECTOR OF THE DEPARTMENT OF EMBRYOLOGY: CARNEGIE INSTITUTION OF WASHINGTON. Year-Book No. 15. 1916. Pp. 103-120.

This report contains reference to a paper which may be of considerable importance to the pathologist and the clinician. P. G. Shipley and R. S. Cunningham (*Amer. Journ. Physiol.*, 1916, vol. xl. pp. 75-81) made an investigation of the *role* played by the omentum in absorption from the peritoneal cavity. The omentum was drawn out of the body through an incision in the middle line of the abdomen and immersed in true solutions, in pseudo-solutions of high molecular dye-stuffs such as trypan blue, in colloidal metals, and in filtered Indian ink. In a number of cases participation of the lymphatics in the process of absorption was eliminated by ligature of the thoracic duct.

After the omentum had been exposed for varying lengths of time, the animals were killed and the tissues examined for evidence of absorption. The results were most unexpected. It was shown that drainage was effected by the blood-vessels. The results were identical whether the thoracic duct was ligatured or not. The conclusion is that in all probability the omentum plays a part in the drainage of the peritoneal cavity, and the path taken by absorbed substances is by the blood-vessels and not by the lymphatics.

REVIEWS.

PLANTS POISONOUS TO LIVE-STOCK. By HAROLD C. LONG, B.Sc. Cambridge: The University Press. 1917. Pp. vi. + 119. 6s.

Every veterinary surgeon engaged in country practice is confronted from time to time with cases of illness or sudden death which give him much anxious thought. It not infrequently happens that some poisonous plant or feeding-meal is responsible for this. Practitioners keep this in mind; but it is seldom easy, and often more than difficult, to point with certainty to the culpable agent. The difficulties of diagnosis are in part due to the indefinite symptoms presented, but probably more especially to the paucity of authentic information available to the practitioner regarding the poisonous plants of this country.

Mr. H. C. Long in writing this book has gone a considerable way toward supplying this much-needed information. It is probable that practically all the known data concerning the toxic principles and history of a wide range of plants are here collected, together with an account of the symptoms of affected animals. Nevertheless the reading of the book has left us with a feeling of disappointment. Presumably the author, during the years which he must have spent in collecting and sorting the very scattered literature on this subject, had in his mind the benefit he would confer upon the farmer and veterinary practitioner when he published the result of what must have been arduous labour. Undoubtedly, both classes will derive much advantage by possessing this book—the veterinary surgeon more than the farmer. It is doubtful, however, if they will get all that they expect. Take, for instance, darnel. A full historical record of the toxicity of this grass is given, the toxic principle is well discussed, and the description of symptoms is as complete as one can expect; but beyond the statement that darnel is of the same genus as rye-grass, no assistance is given us how to identify either seeds or flowering head. It is true that the veterinary student handles darnel repeatedly during his college course, and is perfectly familiar with it at that period, but the modern intensive training of the veterinary surgeon precludes any possibility that he could keep in his mind the botanical characteristics of all the poisonous plants. If in after years he wishes a book of reference which will tell him how to distinguish *Lolium perenne* from *Lolium temulentum*, and buys for this purpose *Plants Poisonous to Live-Stock*, he may experience a certain measure of disappointment.

If Mr. Long could be induced to increase the size of the next issue by

including therein a brief botanical description of the plants and some account of their usual habitat, the utility of the book would be increased out of all proportion to the necessary increase of cost.

(R. G. L.)

THE ORGANS OF INTERNAL SECRETION: THEIR DISEASES AND THERAPEUTIC APPLICATION. A BOOK FOR THE GENERAL PRACTITIONER.
By IVO GEIKIE COBB, M.D., M.R.C.S. London: Baillière, Tindall & Cox. 1917. Pp. x + 236. 5s.

From time to time undercurrents in scientific research make themselves evident by waves of publication in scientific literature. For some years past an enormous amount of work has been done on what used to be called the "ductless glands." Articles innumerable have appeared in the scientific and medical periodicals, and the bibliography of the subject has swelled to large proportions. More recently books of reference have been published, some of them relatively small and somewhat restricted in scope; but others, among which we would include Biedl's *Internal Secretory Organs* and Swale Vincent's *Internal Secretions and the Ductless Glands*, of more generous proportions and exhaustive range. Quite recently (see this *Review*, 1917, Vol. I. p. 173) a most excellent treatise on the endocrine organs has been issued by Sir Edward Schäfer.

But even more significant has been the appearance of handy works directed to the general practitioner; and most recently the initiation, by the Association for the Study of Internal Secretions, of a quarterly journal, *Endocrinology* (No. 1, January 1917), which is to be devoted entirely to the physiology, therapeutics, etc. of the endocrine organs. When a department of science takes to itself its own special periodical it is fairly safe to assume that that branch of science has justification for the step. There can be little question that Barker is right in assuming that the more alert general practitioners already realise the profound importance of an intimate knowledge of the ductless glands and their functions. Nor can we fail to agree with Sajous (also writing in the first number of *Endocrinology*) when he claims that organotherapy is opening up avenues of thought to a new conception of medicine which will satisfy the longing for logical reasoning and rationalism.

The words "internal secretions" mean more than the products of activity of the ductless glands. Abderhalden has already taught that the tissue-cell generally disposes of the same or similar ferments to those secreted by the digestive glands, and that the leucocytes are the carriers of these ferments. This doctrine is in line with that revolt which is slowly taking effect against the old conception that the cell is a unit with little or no influence upon the other components of the body. The interpretation of the phenomena of disease is likely to be profoundly influenced by concepts which are gradually gathering adherents.

Consequently, though they may not contain anything new, nor make great inroads on the store of knowledge gleaned by others, books like the one now before us are to be welcomed. Dr. Cobb, in his preface, disavows

any claim that his book is an exhaustive or complete account of the endocrine organs, nor is it to be considered as a comprehensive therapeutic guide to the administration of the organic extracts. But it seemed to him that a small book containing an account of the diseases and therapeutic application of organic extracts might prove useful. "Hormone-therapy is already established as a recognised therapeutic agent, yet as the books which deal with the ductless glands and their secretions are exhaustive studies including the results of laboratory research in detail, and require far more time to read them than the general practitioner has at his disposal, it is difficult for him to glean the salient facts from these lengthy works."

Though veterinary medicine—at least at the present time—seems to afford less scope for organotherapy than does human medicine, knowledge of what is being done in the physiology and therapeutics of the endocrine organs cannot be neglected.

ENGLISH FARMING, PAST AND PRESENT. By ROWLAND E. PROTHERO, M.P., President of the Board of Agriculture. Second Edition. London: Longmans, Green & Co. 1917. Pp. xv. + 504. 7s. 6d.

It would be difficult to imagine a more opportune time than the present for the appearance of a new edition of Mr. Prothero's *English Farming, Past and Present*. Even that person of devious mentality, the Man in the Street, is having it brought home to him, as never before, that Agriculture is the fundamental industry of Britain. And many and diverse minds are elaborating plans by which agriculture, in the very near future, is to develop with a rapidity and to such a degree as has not hitherto been conceived possible. Statesman, farmer, scientist, publicist, arm-chair theorist, all are evolving schemes whereby the farmer shall wax fat and stand on the pedestal of public admiration as a model benefactor of his race and country. But none in the elaboration and application of his theories can afford to neglect the teaching of history. If history is to be more than a mere story, its revelations must be applied to the problems of the present and the future.

"Great economic changes have resulted from small alterations in the details of manufacturing processes. Similar changes may often be explained by some little-noticed alterations in farming practice." Thus Mr. Prothero in the Preface to the first edition of his book published in 1912. With equal propriety he might have added that alterations in farming practice are not without their effects in producing economic changes. Both sides of the mutual influence, it is reasonable to suppose, will receive consideration by the future would-be maker of agricultural history. And the reformer will certainly require some such work of reference as the one at present before us, though from it he will gain no suggestion of a scheme of reconstruction. "The difficulties which hinder agricultural revival are great. They can only be overcome by the fusion of political parties, acting together in the interests of the nation. In that spirit it may be possible to promote

agricultural progress, to improve the conditions of agricultural labour, to restore life to the village, and to realise some of the hopes which are expressed in the concluding pages of the book."

Of all the many deeply interesting chapters none will appeal to the veterinary reader more strongly than that which is devoted to the consideration of High Farming (1837-1874). The first thirty-seven years of the reign of Victoria of gracious memory was an era of advancing prosperity and progress, and in this Science was in no small measure responsible. "The new alliance of science with practice bore rich and immediate fruit. Science helped farming in ways as varied as they were innumerable. Chemists, geologists, physiologists, entomologists, botanists, zoologists, veterinarians, bacteriologists, architects, engineers, surveyors, statisticians, lessened the risks and multiplied the resources of the farmer. . . . Veterinary skill saved the lives of valuable animals."

In the present conjunction of circumstances the recognition by Mr. Prothero of the influence of veterinary science upon agricultural prosperity is worthy of careful attention. Too often is it said, with justice, that if a balance be struck of the benefits agriculture and veterinary science confer upon each other, the latter would not be found to occupy the position of debtor. It would be ungracious and ungraceful to press this point; but the veterinary scientist and practitioner may he forgiven for sometimes thinking that they give more than they receive.

Many and diverse are the literary tasks Mr. Prothero has set himself, but none is of greater value than *English Farming, Past and Present*, and in none has his versatile pen been wielded with greater lucidity and charm.

TEXT-BOOK OF MEAT HYGIENE. By RICHARD EDELMANN, Ph.D. Third Revised English Edition and Authorised Translation, Revised for America by JOHN R. MOHLER, A.M., V.M.D., and ADOLPH EICHHORN, D.V.S. London : J. & A. Churchill. 1916. Pp. vi. + 452. 21s.

It is reasonable to assume that the former editions of this book are well known to those whose special work is related to meat hygiene. They will, therefore, not require to be reminded that the first two editions suffered from the close adherence of the translation to the German text, and the consequent inclusion of descriptions and regulations applicable to conditions in Germany. In the edition now before us references to German conditions have been deleted. The work, as now prepared, is based on the rules and regulations governing meat inspection in the United States. The new regulations of the Bureau of Animal Industry, especially those respecting the disposal of carcasses and recent measures of control of importation of meat, form a conspicuous feature of the present edition. A new chapter has also been added dealing with the preparation and control of meat-food products.

For the British reader a certain amount of the matter is of interest rather than of applicability; but even that which cannot be applied in this

country will doubtless be acceptable as showing how things are done in a country where conditions are peculiar, but progressive.

In its general treatment of meat hygiene the book should appeal to readers on this side of the Atlantic as a useful work of reference.

THE CANCER PROBLEM. A STATISTICAL STUDY. By C. E. GREEN. New Edition. Edinburgh: W. Green & Son. 1917. Pp. viii. + 140. 21s. nett.

There are few who will not agree with the contention that "there is to-day no greater or more profound mystery than the cancer problem, nor is there any the solution of which would be so beneficial to humanity." Difficult though the problem is, and conflicting though current views may be, Mr. Green sees one or two rays of light looming out of the darkness. He sees indications of great hopefulness in the establishment of three features respecting the incidence of the disease. It is not without significance that statistics of the Registrar-General and private observers prove—(1) That cancer is much more prevalent in some districts than in others; (2) that it is very common in some trades and very uncommon in others; and (3) that these figures are practically constant from year to year.

In the limited scope of a review such as this it is futile to endeavour to adequately show how Mr. Green develops his theses on the local incidence, the occupational incidence, and the crux of the problem. One can only regard with the deepest admiration the stupendous amount of labour and the minute care with which statistics have been collected and collated. A hint of the labour is given by the author when he confesses that he has motored over practically every Scottish county in his endeavour to find a clue to local incidence alone.

That the author is not a member of either the medical or the veterinary profession detracts not a whit from the value of the evidence accumulated. Indeed, he has had the advantage of being untrammeled by the traditions and shibboleths of what some would be unkind enough to call hide-bound corporations. He therefore brings a freshness and originality to a problem which cannot be attacked from too many sides or by minds of too great diversity.

DAIRY CATTLE FEEDING AND MANAGEMENT. By C. W. LARSON, M.S.A., Ph.D., and F. S. PUTNEY, M.S. London: Chapman & Hall. 1917. Pp. xx. + 471. 11s. 6d.

No book written for the guidance of dairy-farmers has given us so much pleasure to read as "Dairy Cattle Feeding and Management." In writing the book the authors do so with the belief "that the lecture system alone does not give the greatest efficiency in teaching. A broader field will be covered and more accurate information will be gained by the student if the lecture is combined with a text-book." With this one can but agree, with the proviso, however, that the text-book is not allowed to become effete; of this there is little fear in America.

It may be truly said that within the pages of this book every branch of dairy-farming receives consideration, and that to each is allotted its due share. That the authors appreciate fully the importance to the dairyman of a clear understanding of the principles of animal nutrition is evident from the chapters devoted to their consideration. The so-called feeding standards which are almost invariably confusing to the student are here so lucidly explained as to admit of no ambiguity.

It is common knowledge that the economical production of milk is not studied by dairymen as much as might be. Concerning this one reads : "It is profitable, however, to give to cows that have the ability to produce large amounts of milk all that is necessary for their normal limit of production. The amount of feed required for maintenance by cows of the same weight and production is practically the same, and the cost of difference of production is due to the amount of feed consumed over that for maintenance. This being the case, it is more profitable to produce milk from a cow that will produce 20 lbs. than from one that will produce 10 lbs. The higher producer is more economical, because she produces more milk with the same maintenance. Two of the less profitable type of cow must be maintained to produce the same amount of milk as is produced by one of the profitable kind. Although it is true that high production is the most economical, it does not follow that it is desirable to force cows to the limit of their production. The last few pounds of milk may cost more than they are worth."

The few pages devoted to the principles of dairy cattle-breeding afford interesting reading, as, for instance :—

"In the earlier days of civilisation mankind did not move readily and rapidly from one portion of the country to another. The result was that Nature with her climate and food developed distinct classes of animals. Within each section, however, man was able to cross animals and thus, within the limits of his art, to improve the breed which he had. Through wars of one race with another, animals were carried hither and yon, and crosses resulted which had their effect on the development of our modern animals. Cæsar in his wars did more to introduce some of the special characteristics which crop out to-day than any other early warrior. For instance, it is believed that the poll characteristic which all of our dairy breeds seem to possess to some extent, and which occasionally crops out, was brought about through Cæsar's wars."

While the chapter dealing with the common diseases of dairy animals contains much useful and practical information and is devoid of the peregrinations into the mazes of pathology and surgery which so often spoil an otherwise useful book, we think that its value would be materially enhanced if some advice were tendered on the nursing and feeding of sick animals.

With the exception of one error, obviously due to the type-setter, where, on page 47, "1·94" should read "0·94" for the starch value of protein, this book, for a first issue, is remarkably free from printers' mistakes, evidence of the care with which it has been compiled.

Though the authors have written for American readers, British agriculturists and veterinary surgeons will find here much profitable and refreshing reading.

(R. G. L.)

THE PRINCIPLES OF FEEDING FARM ANIMALS. By SLEETER BULL, B.S., B.S.Ag., M.S. London : Macmillan & Co. 1916. Pp. xix + 397. 7s. 6d.

American agriculturists are undoubtedly better off than their British *confrères* as regards literature dealing with the nutrition of farm animals. But whatever the number of current books may be, additions to the list are always welcome provided that they are written, as this one obviously is, by one who is a master of his subject. This book, the author says, is an out-growth from a class manual written for the use of elementary students attending a general course in stock feeding. It has been extended to meet the demand from outside sources and will be found an instructive little manual for agricultural students and farmers in its country of origin, and British readers will find much that is interesting on its pages. The chapter dealing with physiology will make clear to the stock-keeper those essentials of nutrition with which he must be familiar if his life's work is to be other than a mere routine. The arrangement of the text is good, and the practice of adding after a general discussion of a food-stuff its suitability for each class of stock saves a deal of repetition and leads to conciseness. The author's too frequent use of "however" is irritating and tends to spoil an otherwise very readable book.

(R. G. L.)

WHAT IS INSTINCT? SOME THOUGHTS ON TELEPATHY AND SUBCONSCIOUSNESS OF ANIMALS. By C. BINGHAM NEWLAND. London : John Murray. 1916. Pp. xv. + 217. 6s.

The author is not always easy to follow, but his main thesis is that what is commonly called *instinct* is really telepathy and the manifestations of a subconscious mind. Whether the application of other names will be a material help in the understanding of an attribute to which psychologists have devoted much study is perhaps open to question. And it may be objected that the author has not adequately grasped the significance of instinct, because he does not clearly recognise that the instinctive actions of animals fall within four categories—self-preservation, reproduction, nutrition, and (the last to be recognised) gregariousness.

Setting aside what one might reasonably call the mystic, and remembering that Mr. Newland, in his Foreword, lays no claim to deep scientific learning, there is much of interest in his book arising out of "personal observations which cover many years' close study in the field." As seems perfectly natural, he has much to say about the "homing instinct." He tells the story of a calf which *may* possibly find a parallel in the experience of his readers. We are told that a Carmarthenshire farmer took a calf, tied in a sack with head protruding, in the bottom of a trap, about two miles to a railway station,

The calf, in the sack, was left on the station platform ; but next morning was discovered in one of the farmer's fields so placed in respect of a river, etc., that it must have returned from the station *in a direct line*. We all know of cases of animals finding their way home in a wonderful manner ; but it is not often we hear of calves "homing" like pigeons. This is not to cast doubt ; but merely to express wonder.

In referring to "shying" horses, Mr. Newland comes to the conclusion that the senses of fear and curiosity are somehow connected. He might have gone further and said that fear, curiosity, and anger are apt to follow each other in series. As witness the behaviour of a herd of cows towards a strange dog.

FARM BUILDINGS AND BUILDING CONSTRUCTION IN SOUTH AFRICA. By W. S. H. CLEGHORNE, B.Sc.(Edin.), A.M.I.Mech.E. London : Longmans, Green & Co. 1916. Pp. xxiii. + 325. 21s.

Though ostensibly written for farmers, agriculturists, teachers, and students in South Africa, this book will appeal directly to all persons interested in economical farming and animal welfare in other countries. This is the first book of its kind to adequately deal with a subject of prime importance. Too often, even to-day, farmers desirous of having improvements effected in existing animal habitations or of having new ones erected are dependent upon the whims and fancies or hide-bound "regulations" of local architects, many of whom, though no doubt excellent designers of human dwellings, have but little knowledge of the hygienic requirements of animals. The advent of this manual has at once removed the difficulties under which many architects work, and will be welcomed by them no less than by stock-keepers.

Students will find that the author has included much information of great value to them concerning essentials of building construction. The chapters dealing with stables and byres are examples of sound common sense, and show the reader that the author has more than a passing knowledge of this important branch of the subject.

The text is amplified by some two hundred illustrations of outstanding merit, none of which seem to be superfluous. (R. G. L.)

NOTES ON BOOKS.

WINNOWED MEMORIES. By Field-Marshal Sir EVELYN WOOD. London : Cassell & Co. 1917. 16s.

Sir Evelyn is not one of those who see no possible national good in hunting. That the author is a first-class sportsman, as well as an ardent soldier, goes without saying ; and, consequently, his chapter on "Hunting as Military Training" will be read with that respect due to any opinion expressed by one who may justly claim to know something of the subject upon which he writes. As a reply to the demand for proof of the beneficent effect of hunting on troop-leading, conclusive instances are adduced. Perhaps the fact that Sir Douglas Haig has been a hunting-man all his life, and is probably the best read man in the British Army at the present moment, will be held as the best of many examples.

BRITISH AGRICULTURE: THE NATION'S OPPORTUNITY. Being the Minority Report of the Departmental Committee on the Employment of Sailors and Soldiers on the Land. By the Hon. E. G. STRUTT, LESLIE SCOTT, and G. H. ROBERTS. With a Preface, and Appendix on the Reclamation of Land, by A. D. HALL. London : John Murray. 1917. Pp. xi. + 168. 3s. 6d.

THE CONTROL OF HUNGER IN HEALTH AND DISEASE. By A. J. CARLSON. (University of Chicago Press.) Cambridge : The University Press. 1917. Pp. vii. + 319. 9s.

Professor Carlson has had the opportunity to make a study of the physiology of hunger in the case of a man in whom a gastric fistula was made on account of stricture of the oesophagus. Experiments have also been conducted on dogs and other animals. The sensation of hunger has been attributed to several factors, such as the rubbing together of folds of the gastric mucous membrane. Carlson has been able to show that the sensation takes origin in receptors in the muscular tunic of the stomach. Hunger contractions, primarily concerned with the pyloric region, cease for a few minutes when food is taken into the stomach. Then digestion contractions, initiated at the cardia, begin.

THE PROBLEM OF PAIN IN NATURE. By CHARLES F. NEWALL. Paisley : Alexander Gardner. 1917. Pp. 131. 3s. 6d.

Mr. Newall is not the first who has been puzzled by the irreconcilability of the doctrine that "whatever is, is best," and the fact of Nature "red in tooth and claw." Nor, we venture to think, will he be the last. Mr. Newall has tackled a big problem, and if he has not succeeded in its solution he may take consolation from the thought that he has failed in good company.

THE MAMMARY APPARATUS OF THE MAMMALIA IN THE LIGHT OF PROTOGENESIS AND PHYLOGENESIS. Three Lectures delivered at the University of London (University College), by Professor ERNST BRESLAU, M.D. London : Methuen & Co. 1917. With 47 Illustrations. 5s. nett.

This volume is based on a course of lectures delivered in 1913 before the University of London, and contains a Preface by Professor J. P. Hill. The book provides the English student with a *résumé* of Professor Breslau's extensive and fundamental investigations on the development of the milk-glands and related parts of the series of the mammalia, and also of his conclusions as to the evolutionary history of the mammary apparatus.

DAIRY-FARMING. By Professor C. H. ECKLES and Professor G. F. WARREN. London : Macmillan & Co. Pp. xv. + 309. 5s.

IL CAVALLO. By General CARLO VOLPINI. Fifth Edition, Revised by Professor ALFREDO GIANOLI. Milan : Ulrico Hoepli. 1917. Pp. xx. + 544. L.7.50.

THE BREEDING OF ANIMALS. By F. B. MUMFORD. London : Macmillan & Co. 1917. Pp. xvii. + 310. 7s. 6d.

THE CAUSES OF TUBERCULOSIS. By LOUIS CORBETT, M.D., F.R.C.S. Cambridge : The University Press. Pp. xvi. + 708. 21s.

THE BIOLOGY OF TWINS. By H. H. NEWMAN. Cambridge : The University Press. 1917. 5s.

MOSQUITOES AND THEIR RELATION TO DISEASE. Their Life-History, Habits, and Control. By F. W. EDWARDS. British Museum (Natural History) Economic Series. 1917. Pp. 20. 1d.

THE METHOD OF ENZYME ACTION. By J. BEATTY, M.A., M.D. London : J. & A. Churchill. 1917. Pp. ix. + 143. 5s.

HERBS USED IN MEDICINE. (First Series.) With Descriptive and Explanatory Notes by Mr. J. D. ELLIS. London: National Herb-Growing Association. Pp. 32. 3s.

LESSONS IN PHARMACEUTICAL LATIN AND PRESCRIPTION WRITING AND INTERPRETATION. By H. C. MULDOON. London: Chapman & Hall. 1917. Pp. vii. + 173. 6s.

TEXT-BOOK OF ELEMENTARY CHEMISTRY. By Dr. F. M. PERKIN and ELEANOR M. JAGGERS. London: Constable & Co. 1916. Pp. vii. + 384. 5s.

ELEMENTARY PRACTICAL CHEMISTRY. Part. II. By Professor F. CLOWES and J. B. COLEMAN. Eighth Edition. London: J. & A. Churchill. 1916. Pp. xvi. + 255. 3s. 6d.

CHEMISTRY FOR BEGINNERS. By C. T. KINGZETT. London: Baillière, Tindall & Cox. 1917. Pp. vi. + 106. 2s. 6d.

A SHORT SYSTEM OF QUALITATIVE ANALYSIS. By Dr. R. M. CAVEN. London: Blackie & Son. Pp. viii. + 162. 2s.

THE TUTORIAL CHEMISTRY. PART II., METALS AND PHYSICAL CHEMISTRY. By Dr. G. H. BAILEY. Edited by Dr. W. BRIGGS. Third Edition. London: W. B. Clive, University Tutorial Press. 1917. Pp. viii. + 460. 4s. 6d.

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A note on a paper under this heading does not preclude a fuller abstract in a later issue.

ANATOMY

(Including Embryology).

LINERBACK, P. E. "The Development of the Spiral Coil in the Large Intestine of the Pig." *Amer. Journ. Anat.* Vol. XX., No. 3. November 1916. Pp. 483-503. 23 Figures.

This paper contains an attempt to present the development of the colon of the pig in greater detail than has been given hitherto.

MORRILL, C. V. "On the Development of the Atrial Septum and the Valvular Apparatus in the Right Atrium of the Pig Embryo, with a Note on the Fenestration of the Anterior Cardinal Veins." *Amer. Journ. Anat.* Vol. XX., No. 3. November 1916. Pp. 351-373. 9 Figures.

RETTERER, E., and NEUVILLE, H. "The Penis of the Sheep" (Du pénis et du gland du mouton). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 287-290.

A comparison of the structure and evolution of the penis and the glans in the castrated male and the ram.

— — — "The Development and Homology of the Glans Penis of Ovines, Antelopes, and Bovines" (Du développement et des homologies du gland des Ovinés, des Antilopinés et des Bovinés). *C. R. Soc. Biol.* Vol. LXXX., No. 7. 31st March 1917. Pp. 339-343.

SWIFT, C. H. "Origin of the Sex-Cords and Definitive Spermatogonia in the Male Chick." *Amer. Journ. Anat.* Vol. XX., No. 3. November 1916. Pp. 375-410. 6 Figures.

CLINICAL.

AVESTON, J. J. "Strangles without Rise of Temperature." *Vet. Record.* Vol. XXIX., No. 1508. 2nd June 1917. Pp. 504.

The writer cannot help thinking that strangles without fever is not very infectious.

BARTH, A. "Paralysis of the Rectum and Tail in a Horse" (Hammelschwanz bei einem Wallachen). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 5. May 1917. Pp. 278-281.

Particulars of the symptoms in a seven-year horse in which the tail, rectum, and bladder were paralysed. Post-mortem examination disclosed a hypertrophy of the perineurium of the second pair of sacral nerves about 3 c.m. from their roots. The paralysis was evidently produced by pressure of the hypertrophied perineurium upon those nerve-fibres which supply the bladder, rectum, and muscles of the tail.

BOLTON, R. R. "Œsophageal Spasms in Colts." *Journ. Amer. Vet. Med. Assoc.* Vol. I., No. 7. March 1917. Pp. 876-879.

— "Chronic Effusive Pleurisy. Cause Unknown." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 231-235.

A careful account of the clinical and post-mortem features of a case of chronic pleurisy with effusion in a nine-year-old mare.

CHOLET, R. "Torsion of the Uterus in a Bitch" (Torsion de l'utérus chez la chienne. Hystérectomie, guérison). *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 21st December 1916. Pp. 410-414. 2 Figures.

CHOULEUR. "Treatment of a Severe Wound with the Polyvalent Serum of Leclainche and Vallée" (Traumatisme grave de l'encolure. Guérison rapide, sans complication, par le sérum polyvalent Leclainche et Vallée). *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 116-117.

COCU. "Sudden Death of a Horse from Thrombosis of the Left Ventricle" (Mort subite d'un cheval par thrombose du ventricule gauche. Fibromes fasciculés du muscle diaphragme et du petit oblique de l'abdomen). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 15th February 1917. Pp. 88-91.

COSGROVE, J. J., and SCOTT, W. "Mammitis in Cows." *Vet. News.* Vol. XIV., No. 689. 17th March 1917. Pp. 106-107.

A case of mammitis in a cow carrying her third calf successfully treated by an autovaccine.

DUVILLARD, A. "Perforation of the Lung with Extensive Emphysema" (Perforation pulmonaire avec emphysème sous-cutané). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 5. May 1917. Pp. 281-284.

A small perforation (apparently spontaneous) of the right lung resulted in collapse of the organ as the consequence of pneumothorax. The air found its way from the thorax along the aorta into the abdomen and pelvis. There was also subcutaneous emphysema over the right side of the chest and flank. All the organs of the thorax and abdomen were healthy.

FRASER, H. "Interesting Case in a Foal." *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 164-165.

HUDSON, R. "Uterine Septicæmia (Subacute) : Endocarditis in Mares." *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 101-102.

Four cases of vegetative endocarditis are briefly described as having occurred in mares where a post-mortem examination revealed the lesion. In another case—after abortion—no post mortem was made. Three of the cases followed parturition. It is suggested that the condition was due to retention of some portion of the foetal membranes or fluid, followed by absorption of septic products from the uterus.

MAYALL, G. "Canine, Feline, and Porcine Cases." *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 165-167.

PATRICK, W. C. "An Interesting Monorchid." *Vet. News.* Vol. XIV., No. 698. 19th May 1917. Pp. 200-201. 2 Figures.

The right testis was removed by the flank operation. It consisted almost wholly of cysts, and contained no spermatozoa. The left testis was in the scrotum, and contained a dermoid cyst with hair and epithelial débris. Spermatozoa were numerous in the epididymis.

PERROT, G. "Acute Purulent Peritonitis in an Ox" (Péritonite purulente suraiguë par ouverture d'abcès chez le bœuf). *Rec. Méd. Vét.* Vol. XCIII., No. 7-8. 15th April-15th May. Pp. 197-199.

A rapidly fatal case of peritonitis in a young ox (about thirty months old) due to the spontaneous rupture of an abscess between the liver and the diaphragm. Other abscesses were present in and about the liver and in the right lung. The nature of the abscesses was not determined, but they were certainly old-standing.

PIOT-BEV. "Renal Hæmorrhage in an Ox" (Hémorragie rénale foudroyant chez un bœuf). *Rec. Méd. Vét.* Vol. XCII., No. 23. 15th December 1916. Pp. 683-684.

PIOT-BEY. "Rupture of the Stomach and Cancer of the Pylorus in a Mule" (Déchirure de l'estomac et cancer pylorique chez le mulet). *Rec. Méd. Vét.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 196-197.

POSOCO, C. "Two Cases of Ranula" (Di due casi di ranula (idroglosso sublinguale)). *Il Moderno Zootiatro. Parte Sci. Ser. V.*, Vol. XI., No. 1. 21st January 1917. Pp. 20-21.

One case occurred in a pig; the other in a dog. Both were treated successfully by opening up the ranula and cauterising the interior with nitrate of silver.

ROBERT and THEVENET. "Treatment of Wounds with the Polyvalent Serum of Leclainche and Vallée" (Traitement des plaies par le sérum polyvalent de MM. Leclainche et Vallée. Observations cliniques). *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 113-116.

An account of the successful treatment of a series of different kinds of wounds by the Leclainche and Vallée serum.

ROCTON. "Treatment of Tetanus" (Contribution à l'étude du traitement du tétanos. Emploi du bromhydrate de cicutine). *Rec. Méd. Vét.* Vol. XCII., No. 23. 15th December 1916. Pp. 684-686.

A case of tetanus in a six-year mare was treated, at the offset, with an injection of antitetanic serum. The disease developed rapidly and the case was serious. Eighty grammes of chloral hydrate produced no good results. Injections of 20 centigrammes of bromhydrate of cicutine five times a day is regarded as having effected a cure in six days.

SCHWENDIMANN. "Clinical Cases." ((1) Periostitis an der Dorsalfläche des Fesselbeins. (2) Hydrocele funiculi. (3) Ektopia testis extra-abdominalis.) *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 4. April 1917. Pp. 220-227.

The first case was one of periostitis on the dorsal (anterior) surface of the first phalanx. The treatment consisted in rubbing in biniodide ointment (1 in 6), and the application of a cotton-wool dressing. Eight days afterwards, a plaster bandage was placed over the dressing. In a fortnight this bandage was removed and the animal given exercise for half an hour daily. Massage and fomentations completed the treatment.

In the second case a hydrocele of the spermatic cord simulated a hernia.

The third case was one in which a rudimentary testicle was discovered in the subcutaneous tissue of the prepuce.

SCOTTI, B. "Urinary Calculi in a Horse" (Calcolosi delle vie urinarie nel cavallo). *Il Moderno Zootiatro. Parte Sci. Ser. V.*, Vol. VI, No. 2. 28th February 1917. Pp. 40-49.

SMITH, S. "Milk Fever (?) in a Goat." *Vet. Record.* Vol. XXIX., No. 1507. 26th May 1917. P. 491.

The illness occurred twenty-nine days after kidding. The author, therefore, thinks it was a case of deferred milk fever.

SOLIS, J. "Tetanus in a Mule" (Curación del tétanos en un mulo). *Revista Hig. y Sanidad Vet.* Vol. VI., No. 12. March 1917. Pp. 907-908.

An account of successful treatment mainly by repeated doses of anti-tetanic serum.

SPREULL, A. "An Interesting Case." *Vet. News.* Vol. XIV., No. 689. 17th March 1917. Pp. 107-108.

Fracture of the first and second phalanges of the hind limb treated by immobilisation with plaster of Paris and rest in slings. Recovery.

TUTT, J. F. D. "An Interesting Case of Fracture of the Os Coronæ." *Vet. Record.* Vol. XXIX., No. 1501. 14th April 1917. P. 426.

The horse first went lame after jumping in November 1915. On 4th February 1917 he fell over a bank and got up dead lame. About the end of February the animal was destroyed. The second phalanx (os coronæ) was found to be fractured into eight pieces firmly held together by a mass of newly formed connective tissue. During life no crepitus could be detected.

— "An Interesting Case of Fibromata." *Vet. Record.* Vol. XXIX., No. 1498. 24th March 1917. Pp. 393-394. *Vet. News.* Vol. XIV., No. 691. 31st March 1917. P. 127.

A case is described which in some respects resembled epizootic lymphangitis. "The whole region from the point of the elbow to the lower third of the shank was covered with a number of eruptions. Some of these had ruptured and were literally ulcers, those that had not broken resembled small subcutaneous tumours or fibromata. The lymphatics of the region were corded as is frequently seen along the side of the neck in some cases of equine glanders." The animal became worse and was destroyed. The lesions on the limb had become definite fibromata. The liver was found to be full of these tumours.

WYNN LLOYD, L. W. "Simultaneous Paralysis of the Anterior Crural and Radial Nerves." *Vet. News.* Vol. XIV., No. 692. 7th April 1917. Pp. 136-137.

The case was the result of an accident. The animal was kept in slings for four weeks and returned to work in six weeks.

DIETETICS.

ARMSBY, H. P., FRIES, J. A., and BRAMAN, W. W. "Energy Values of Red-Clover Hay and Maize Meal." *Journ. Agric. Res.* Vol. VII., No. 9. 27th November 1916. Pp. 379-387. 12 Tables.

BEALS, C. L., and LINDSEY, J. B. "Chemical Composition, Digestibility, and Feeding Value of Vegetable-Ivory Meal." *Journ. Agric. Res.* Vol. VII., No. 7. 13th November 1916. Pp. 301-320. 24 Tables.

BEAUVERIE, J. "The Moulds of Ground-Nut Cake" (Les moisissures des tourteaux d'arachide cultivant à 37°). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 311-313.

Ground-nut cake, so much used for French Army horses, appears to be particularly rich in moulds. Beauverie has been able to isolate six species known to be pathogenic or belonging to pathogenic genera. Though horses are able to digest these moulds without inconvenience, the author suggests that precautions should be taken, for the organisms after passing through the alimentary canal may become dangerous under certain conditions.

GRUTER, F. "Lack of Fodder and the Incidence of Disease" (Der Einfluss des Kraftfuttermangels auf das Vorkommen einiger Krankheiten während der Kriegszeit). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 2. February 1917. Pp. 97-103. 1 Table.

LAMB, A. R. "The Relative Influence of Micro-Organisms and Plant Enzymes on the Fermentation of Corn Silage." *Journ. Agric. Res.* Vol. VIII., No. 10. 6th March 1917. Pp. 361-380. 13 Figures, 9 Tables.

LINTON, R. G. "The Maintenance Requirements of Horses and the Thermic and Dynamic Values of their Food-Stuffs." *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Pp. 116-130. 1 Chart.

MARCENAC. "Feeding of Horses on Campaign. The Use of Kitchen Waste" (Alimentation du cheval en campagne. Utilisation des déchets de cuisine). *Rec. Méd. Vét.* Vol. XCIII., No. 3-4. *Bull. Soc. Centr. Méd. Vét.* 1st February 1917. Pp. 76-85.

RITZMAN, E. G. "Ewes' Milk: Its Fat Content and Relation to the Growth of Lambs." *Journ. Agric. Res.* Vol. VIII., No. 2. 8th January 1917. Pp. 29-36. 3 Tables, 1 Figure.

SIMMONS, R. C. "Beef-Feeding Experiment No. 3." *Rhodesia Agric. Journ.* Vol. XIV., No. 1. February 1917. Pp. 24-28.

WEILL, E., and MOURIQUAND, G. "Result of Feeding Guinea-Pigs with Barley in the 'Quiescent' and 'Germination' State" (Résultats comparés de l'alimentation des cobayes par l'orge complète en état "quiescent" ou en état de "germination"). *C. R. Soc. Biol.* Vol. LXXX., No. 1. 6th January 1917. Pp. 33-35.

— — — "The Food Value of Raw, Sterilised, and Decorticated Maize" (Recherches expérimentales sur la valeur alimentaire du maïs ; maïs cru, stérilisé et décortiqué). *C. R. Soc. Biol.* Vol. LXXX., No. 8. 21st April 1917. Pp. 372-375.

WOOD, T. B., and ADIE, R. H. "The Composition and Classification of Wheat Offals." *Journ. Board of Agric.* Vol. XXIII., No. 12. March 1917. Pp. 1179-1187. 3 Tables, 1 Diagram.

GENERAL.

BRENTANA, D. "North-American Horses" (Alcune osservazioni sui cavalli Nord-Americanici). *Il Moderno Zootrofo.* Parte Sci. Ser. V., Vol. VI., No. 2. 28th February 1917. Pp. 25-40. 3 Tables, 2 Figures.

— "The Relation between the Size of the Body, the Live Weight, the Nett Weight, and the Weight of the Heart and Lungs of Schwyz and Parmesan Cattle" (Ricerche sul rapporto tra misure somatiche estrene, peso vivo e peso netto, e il peso del cuore e dei pulmoni in bovine di razza Schwyz e Parmigiana). *Il Moderno Zootrofo.* Parte Sci. Ser. V., Vol. VI., No. 3. 31st March 1917. Pp. 61-79. 4 Tables.

LEESE, A. S. "'Tips' on Camels, for Veterinary Surgeons on Active Service." *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 79-89. *Ibid.* No. 4. April 1917. Pp. 136-140. *Ibid.* No. 5. May 1917. Pp. 167-173.

LEPINAY, L. "Concerning the D.C.M. and Cavalry in General" (Dispositions diverses concernant les D.C.M. et la cavalerie en général). *Rev. Path. Comp.* Vol. XVII., No. 133. April 1917. Pp. (35) 99-(46) 110.

MAGNE, H. "The Scientific Work of Chaveau" (L'œuvre scientifique de Chaveau). *Rec. Méd. Vét.* Vol. XCIII., No. 5. 15th March 1917. Pp. 101-121.

324 BIBLIOGRAPHY—GENETICS AND HEREDITY

PREVOT. "A Visit to an English Dépôt for Sick Horses" (Une visite au dépôt anglais de chevaux malades). *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 109-112.

RAINNEY, J. W. "The Army Veterinary Service, 1914-1916." *Journ. Roy. United Service Inst.* Vol. LXII., No. 446. May 1917. Pp. 232-259.

TIMMIS, R. S. "Some Notes on our Army Horses." *Bloodstock Breeders' Rev.* Vol. VI., No. 1. April, 1917. Pp. 77-78.

WARD, A. R. "The Veterinarian in the Bureau of Animal Industry." *Cornell Veterinarian.* Vol. VII., No. 2. April 1917. Pp. 135-138.

A short account of the veterinary work of the bureau. Twelve hundred and twenty-seven veterinarians are employed, of which number the Meat Inspection Division employs 784. During 1915 58,231,862 ante-mortem and 58,022,884 post-mortem inspections were made. Altogether, the control of meat and meat-food products will cost the bureau 3,493,760 dollars this year. During 1915 the Field Inspection Division made over eleven million inspections of cattle for ticks, and 6678 dipping-vats were in operation.

"With the Horses at the Front." *Field.* Vol. CXXIX. No. 3361. 26th May 1917. Pp. 732-733. 5 Figures.

"Everyone knows nowadays that the Army has its own veterinary service, which has done, and is doing, excellent work, and the great increase in its duties is shown by the statement that whereas in 1914 the service consisted of 431 officers and men it now has a strength of considerably over 25,000."

GENETICS AND HEREDITY.

WELCH, W. H. "The Sterile and Shy Breeding Stallion." *Amer. Journ. Med. Vet.* Vol. XII., No. 4. April 1917. Pp. 217-220.

WREIDT, C. "Correlation Between the Size of Cannon Bone in the Offspring and the Age of the Parents." *Journ. Agric. Res.* Vol. VII., No. 8. 20th November 1916. Pp. 361-371. 6 Tables, 5 Figures.

HISTORICAL.

KENDALL, W. T. "Notes on the Early History of the Veterinary Profession in Victoria." *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Australian Supplement. Pp. 2, 6.

SMITH, F. "The Early History of Veterinary Literature and its British Development." *Journ. Comp. Path. and Therap.* Vol. XXX., Part I. March 1917. Pp. 1-28. 1 Plate.

A review of the writings of Gervase Markham. To be continued.

HYGIENE AND PREVENTIVE MEDICINE.

ALLEN, P. W. "Comparison of the Rate of Multiplication of Bacteria in Raw Milk with the Rate in Pasteurised Milk." *Journ. Inf. Dis.* Vol. XIX., No. 5. November 1916. Pp. 721-728. 3 Tables, 7 Charts.

Aseptically drawn milk was divided into 200 c.c. portions. One portion was Pasteurised ; the other was not. It seems that raw milk as compared with Pasteurised milk has a powerful influence on the multiplication of certain bacteria. After Pasteurisation the organisms which remain in the milk and those which are able to get into the milk find conditions more favourable for their rapid multiplication than before Pasteurisation.

AYERS, S. H., BOWEN, J. T., and JOHNSON, W. T. "Cooling Hot-Bottled Pasteurised Milk by Forced Air." *Bull. No. 420.* Professional Paper. U. S. Dept. Agric. 27th October 1916. Pp. 1-38. 5 Tables, 20 Figures.

BARRIER, G. "Control of the Manufacture of Preserved Meat" (Contrôle des conditions de fabrication et de mise en vente des conserves de viandes). *Rec. Méd. Vét.* Vol. XCIII., No. 5. Pp. 139-145.

COATES, J. "Measures to be Taken to Prevent Contamination of Food by Flies." *Journ. Roy. San. Inst.* Vol. XXXVIII., No. 1. March 1917. Pp. 43-50.

This includes the description of milk receptacles approved by the St. Helens Health Committee.

GERMAIN, R. "Inspection of Preserved Foods" (Inspection des conserves alimentaires en boîtes stérilisées). *Rec. Méd. Vét.* Vol. XCIII., No. 5. 15th March 1917. Pp. 122-139. 3 Figures.

NASMITH, G. C. "A New Type of Trickling Filter." *Journ. Roy. San. Inst.* Vol. XXXVII., No. 4. December 1916. Pp. 189-193

A new method of sewage disposal.

RUEDIGER, G. F. "The Milking Machine a Source of Bacterial Contamination of Milk." *Journ. Inf. Dis.* Vol. XIX., No. 4. October 1916. Pp. 652-654. 2 Tables.

A bacteriological study was made of milk delivered to the retailers in La Salle and Peru, Illinois, and compared with milk drawn by hand. It was found that milk may be badly contaminated by the milking machine if the teat-cups and rubber tubes are not carefully cleaned and scalded before each milking.

Immersing the cups and tubes in a solution of "B-K" or chlorinated lime does not satisfactorily prevent bacterial growth in the tubes. A mere inspection of the dairy without bacteriologic control of the milk may fail absolutely to locate an unsanitary process in the production of the milk.

INFECTIOUS DISEASES.

ANDREWES, F. W. "On the Intrathecal Route for the Administration of Tetanus Antitoxin." *Lancet.* Vol. CXCII., No. 4888. 5th May 1917. Pp. 682-685.

BERNATH, R. I. "Equine Infectious Ophthalmia." *Cornell Veterinarian.* Vol. VII., No. 2. April 1917. Pp. 138-139.

This disease has also been called "recurrent ophthalmia," "pink-eye," "periodic ophthalmia," and "moon-blindness." The causal agent is not known, but the writer regards the disease as infectious. He has failed to produce the disease experimentally. The disease may appear suddenly or with an insidious onset. Its course is protracted, with intermittent acute manifestations. There is photophobia, lachrymation, hypertonia due to sero-haemorrhagic effusion into the eyeball, corneal opacities, adherent irido-cyclitis, affections of the lens, and retinal atrophy. Treatment has been unsatisfactory.

BRUCE, D. "The Intramuscular *versus* the Intrathecal Route in the Treatment of Tetanus by the Injection of Antitoxin." *Lancet.* Vol. CXCII., No. 4888. 5th May 1917. Pp. 680-682. 1 Table.

CAMUS, L. "Experimental Generalised Vaccinia" (Des suites de la vaccine généralisée expérimentale). *Bull. Acad. Méd.* Vol. LXXVII., No. 12. 20th March 1917. Pp. 402-405.

In this note Camus relates the fate of the animals in which he had produced generalised vaccinia (see this *Review*, Vol. I. p. 128). Of the five animals the monkey died slowly of the infection; one of the rabbits was killed in a state of advanced cachexia; the remaining animals recovered.

Discrete generalised vaccinia is benign and tends to recovery. Severe

generalised vaccinia, accompanied by abundant eruptions, is serious, and may lead to death by confluence of the pustules in certain regions, by secondary infection, or by general exhaustion.

CHAPRON, H. "Incubation Period of Epizootic Lymphangitis" (Observations relatives à l'incubation de la lymphangite épizootique). *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 30th December 1916. Pp. 402-404.

CHARMOY. "Epizootic Lymphangitis" (Sur la lymphangite épizootique). *Rec. Méd. Vét.* Vol. XCIII., No. 7-8. 15th April-15th May 1917. Pp. 179-196. 5 Figures.

CHÉNIER. "Epizootic Lymphangitis" (Sur la lymphangite épizootique). *Rev. Path. Comp.* No. 131. February 1917. Pp. 11-15.

DALRYMPLE, W. H. "Anthrax." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 831-846. 5 Figures. *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. P. 153.

The author does not think that it would be wise to discard entirely the Pasteur method of protection for more recent vaccines and serum until these have been more thoroughly tried.

DEAN, H. R. "A Report on Twenty-Five Cases of Tetanus." *Lancet.* Vol. CXCII., No. 4888. 5th May 1917. Pp. 673-680. 2 Tables.

EDMONDS, C. R., and PINCHIN, G. "Quarter Evil." *Rhodesia Agric. Journ.* Vol. XIV., No. 1. February 1917. Pp. 43-46.

For Rhodesia "the treatment that is recommended for places that only occasionally get the disease is to keep the young stock in the spring, when the grass shoots and becomes plentiful, upon some high-lying, rather poor pasture, and if the disease breaks out, to move the kraal and feeding-ground to a fresh portion of the farm. This frequently stops the disease at once."

EICHHORN, A. "Vesicular Stomatitis in Cattle." *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. P. 162.

FAYET. "Treatment of Epizootic Lymphangitis" (À propos de la lymphangite épizootique et de son traitement). *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 104-109.

GAIR, G. "Impetigo." *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 90-91.

This paper describes a staphylococcus, Gram-positive, which grows on agar at a temperature of 37° C., as being found in the skin lesions of impetigo in children and dogs.

GIBBS, H. E. "A Report Upon an Outbreak of Stomatitis Contagiosa." *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 147-155. 4 Figures.

GIBSON, C. L. "Comparative Value of the Methods of Treating Tetanus." *Amer. Journ. Med. Sci.* Vol. CLII., No. 6. December 1916. Pp. 781-799.

The author is inclined to make a trial of atropin as a method of controlling spasm. Antitoxin treatment should be begun immediately on suspicion of tetanus developing rather than waiting for the classical symptoms.

GOLLA, F. "A Comparison of Subcutaneous with Intravenous and Intra-thecal Administration of Tetanus Antitoxin in Experimental Tetanus." *Lancet.* Vol. CXCII., No. 4888. 5th May 1917. P. 686.

GRÄUB, E. "The Ophthalmic Reaction and Conglutination in the Diagnosis of Glanders" (Über die Verwertbarkeit der Ophthalmoreaktion und der Konglutation zur Rotzdiagnose, nebst Mitteilungen über die Technik der Konglutationsmethode). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 3. March 1917. Pp. 129-154.

GREGG, J. "Vesicular Stomatitis Contagiosa." *Vet. Record.* Vol. XXIX., No. 1497. 17th March 1917. Pp. 381-382.

This paper contains a general account of the disease and a detailed description of a micrococcus which is the alleged causal agent. The organism apparently dies out unless successive cultures are made, for out of five cultures left alone for ten days only one had live organisms in it at the end of that time. Cultivated through many generations for about three months, the organism produced a mild form of the disease when tested on seven mules.

Treatment of the disease consists in hyposulphite of soda in the drinking-water, with the daily local application of weak permanganate of potassium and alum solution.

GREGG, J., MAGUIRE, F. X., GLOVER, G. J., GILLESPIE, A., and GREGORY, G. "Vesicular Stomatitis Contagiosa." *Amer. Journ. Vet. Med.* Vol. XII., No. 4. April 1917. Pp. 221-222.

INGLIS, T. M. "Tetanus Bacillus and its Microbial Associates." *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 94-96.

The author has not been favourably impressed with the value of anti-tetanin as a curative, and considers that it should not be relied upon if the symptoms of the disease are fully established.

JOHNSON, P. E. "Infectious Stomatitis." *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 882-883.

LAVERAN, A. "Surra, Nagana Ferox, Nagana of Uganda, and *Trypanosoma rhodesiense*" (Surra, nagana ferox, nagana de l'Ouganda et infections dues au *Trypanosoma rhodesiense*). *Bull. Soc. Path. Exot.* Vol. IX., November 1916. Pp. 731-737.

LENTZ, W. J. "An Experience with Different Treatments for 'Shipping-Fever' in a Sales Stable." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 193-200.

LOPEZ, C. L., and ARMENDARITZ, J. G. "The Prevention of Anthrax" (Prevención anticarbuncosa en general). *Rev. Hig. y Sanidad Pecur.* Vol. VII., No. 1. April 1917. Pp. 1-44.

MARSHALL, C. J. "Possibilities and Limitations in Control of Abortion." *Amer. Vet. Med. Journ.* Vol. XII., No. 3. March 1917. Pp. 157-158.

MOHLER, J. R. "Shipping-Fever in Horses." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 817-823.

The name "shipping-fever" is a general term applied to any one of a group of epizootic infections of equines which occur after the shipment of young western animals eastward, or of country horses to city stables. Most authors, however, recognise and describe these shipping infections under three distinct names—strangles, influenza, and contagious pneumonia.

MONTGOMERY, R. E. "On a Tick-Borne Gastro-Enteritis of Sheep and Goats Occurring in British East Africa." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 28-57. 6 Charts.

MORI, N. "Exudative Pleuro-Pneumonia of Goats" (Sulla profilassi e sulla cura della pleuropolmonite essudativa delle capre). *Il Moderno Zooiatro. Parte Sci.* Vol. V., No. 12. 31st December 1916. Pp. 285-289.

— "Rabies and Hæmorrhagic Septicæmia in Buffalo Calves" (Rabbia e setticemia emorragica in alcuni bufalotti). *La Clinica Vet.* Vol. XL., No. 7. 15th April 1917. Pp. 177-191. *Ibid.* No. 8. 30th April 1917. Pp. 211-223.

Four buffalo calves were affected with a nervous disease which the author thinks is the first recorded observation of rabies in the buffalo. The disease was complicated and terminated by hæmorrhagic septicæmia.

MUNRO, A. "Joint-Ill in Foals." *Vet. News.* Vol. XIV., No. 700. 2nd June 1917. Pp. 220-221.

"Six years of treating the mares has convinced me that the absence of joint-ill in Shire breeding studs, where there were formerly three or four foals dying every year, is due to treating the mares before the foals are born."

PETERS, A. T. "A Rational and Successful Method of Preventing Abortion in Cattle." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 211-214.

The author thinks that deficiency of mineral matter in the body disposes to disease.

PROESCHER, F., and SEIL, H. A. "The Etiology of Hog Cholera." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 64-69. 5 Figures.

REICHEL, J., and HARKINS, M. J. "The Diagnosis of Infectious Abortion of Cattle (Bang's Disease), with Special Reference to the Intradermal Abortin Test." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 847-862. 3 Tables, 4 Figures.

SAVARY. "Treatment of Tetanus" (*Traitement du tétanos*). *Bull. Soc. Méd. Vét. Pratique.* Vol. I., No. 3. March 1917. Pp. 68-71.

Gives a short description of four cases of tetanus treated with injections of phenolised oil. Two of the cases recovered; two died.

SCHROEDER, E. C., and COTTON, W. E. "Some Facts about Abortion Disease." *Journ. Agric. Res.* Vol. IX., No. 1. 2nd April 1917. Pp. 9-16.

SIEGMUND, B. "Rabies" (*Lyssa*). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 4. April 1917. Pp. 211-220.

Describes five cases of rabies in dogs.

TRUCHE and GUIGNARD. "Epizootic Lymphangitis" (Contribution à l'étude de la lymphangite épidémiologique). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 64-68.

TRUCHE, C. "The Treatment of Ulcerative Lymphangitis of the Horse" (Traitement de la lymphangite ulcérante du cheval par la bactériothérapie). *C. R. Acad. Sci.* Vol. CLXIV., No. 12. 19th March 1917. Pp. 497-499.

The treatment consists in the injection of Priesz-Nocard bacilli killed by a mixture of alcohol and ether. Good results are claimed. Elephantiasis does not occur. The method is simple, practical, and cheap and permits of the discharge from hospital of otherwise useless horses.

TURNER, W. "Tetanus and Its Antitoxin." *Lancet.* Vol. CXCII., No. 4884. 7th April 1917. Pp. 532-533.

"With regard to the prophylactic effect of tetanus antitoxin it is rational to conclude that it will vary according to the amount of toxic material intro-

duced into a wound, as well as to the dose of antitoxin given. It is a well-established fact that the effect will be largely influenced by the route of administration—the intrathecal route having been found by far the most efficacious."

TUTT, J. F. D. "Suppurating Infection of the Coronet and Pastern." *Vet. Record.* Vol. XXIX., No. 1499. 31st March 1917. Pp. 405-406.

VAN SACEGHEM, R. "Equine Ulcerative Dermatitis" (Etude sur des cas de dermite ulcéruse des équidés observés au Congo belge). *Bull. Soc. Path. Exot.* Vol. IX., No. 9. November 1916. Pp. 675-679.

VELU. "Epizootic Lymphangitis: Symptomatology (La lymphangite épizootique: symptomatologie, d'après 300 observations personnelles). *Rec. Méd. Vét.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vét.* 1st March 1917. Pp. 99-104.

— "Epizootic Lymphangitis (La lymphangite épizootique. Localisation. Durée d'évolution). *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 7th December 1916. Pp. 385-388.

WILLIAMS, W. L. "Diseases of New-Born Calves and Outline of Recommendations for Control." *Cornell Veterinarian.* Vol. VII., No. 2. April 1917. Pp. 110-134.

This article is part of an extensive communication on "Researches upon Abortion of Cattle," which will appear in the *Annual Report* of the New York State Veterinary College.

ZONCHELLO, A. "Cattle Plague in Sahel" (Il gulhai nel Sahel). *La Clinica Vet.* Vol. XL., No. 5. 15th March 1917. Pp. 113-135.

MEDICINE.

AVERY, R. F. "Periodic Ophthalmia." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 78-81.

The treatment suggested is the injection of compound tincture of iodin into the extra-orbital adipose tissue. It is not possible to differentiate all primary attacks of periodic ophthalmia from other eye diseases. All cases, therefore, must be looked upon with suspicion.

CHÉNIER, G. "Artificial Emunctories" (Sur les émonctoires artificiels). *Rev. Path. Comp.* No. 132. March 1917. Pp. 21-22.

Pleads for the return of the seton.

COSGROVE, J. J., and SCOTT, W. "Mammitis in Cows." *Vet. Record.* Vol. XIV., No. 692. 7th April 1917. P. 136. *Ibid.* No. 694. 21st April 1917. Pp. 157-158.

FOURNIER. "Intratracheal Injections of 1 Per Cent. Creosote in Alcohol in Pneumonia in the Horse" (Des injections intra-trachéales d'alcool créosoté à 1 p. 100 dans le traitement de la pneumonie du cheval). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 15th February 1917. Pp. 92-94.

Good results are claimed for the *very slow* intratracheal injection, morning and night, of 10 c.c. of a mixture consisting of 100 grammes of 60 per cent. alcohol and 1 gramme of creosote.

FOX, J. "Treatment of Respiratory Diseases by Intratracheal Injections of Formalin." *Vet. Record.* Vol. XXIX., No. 1501. 14th April 1917. Pp. 426-427.

A summary account is given of a number of cases of respiratory disease successfully treated by the intratracheal injection once or twice daily of 10 c.c. of a 4 per cent. solution of formalin in distilled water.

FROST, J. N. "Formalin in the Treatment of Mastitis." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 85-88.

The author reports gratifying results from the administration of formalin. He has given 25 c.c. daily for two weeks and has failed to see that it has produced any bad effects, either by loss of appetite, constipation, or impaction. He has also given 50 c.c. at one time without bad effect.

MAYALL, G. "Points in Pig Practice." *Vet. News.* Vol. XIV., No. 699. 26th May 1917. Pp. 212-313.

"One of the most frequent complaints we are consulted on is where young pigs go up to a trough and then run back and fall, kicking spasmodically or rolling over, as if possessed of the devil, like the Gadarene swine. . . . Calomel in full doses is perhaps the best remedy, but occasionally sulphate of soda is better."

MILL, R. J., and ROBERTSON, MADGE E. "Thymusectomy and its Relationship to Rickets." *Journ. Path. and Bact.* Vol. XXI., No. 1. December 1916. Pp. 1-13. 4 Plates, 15 Figures, 2 Charts.

RITZENHALTER. "Fixation-Abscess" (Über Fixationsabszesse). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 5. May 1917. Pp. 273-278.

SCOTT, W. "Purpura. Hæmorrhagica." *Vet. Record.* Vol. XXIX., No. 1500. 7th April 1917. Pp. 416-417.

METHODS.

BERTHELOT, A. "Vegetable Bouillon as a Culture Medium" (Sur l'emploi du bouillon de légumes comme milieu de culture). *C. R. Soc. Biol.* Vol. LXXX., No. 3. 3rd February 1917. Pp. 131-133.

— J. "Proteolytic Peptone of Beef and Intestinal Mucosa in the Preparation of Culture Media" (Applications d'une peptone protéolitique de viande et de muqueuse intestinale à la préparation des milieux de culture). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 298-300.

BRIDRÉ, J. "Examination of Smears Without Staining" (Examen microscopique des frottis sans coloration). *C. R. Soc. Biol.* Vol. LXXX., No. 7. 31st March 1917. P. 332. *Rec. Méd. Vét.* Vol. XCIII., Nos. 9-10. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 132-133

States that the method of examination without staining is to be recommended, in particular, in the examination of pus for the cryptococcus of Rivolta.

CAMMIDGE, P. J. "An Improved Method for the Estimation of Sugar in the Urine and Blood." *Lancet.* Vol. CXCII., No. 4886. 21st April 1917. Pp. 613-614.

DONALDSON, R. "An Easy and Rapid Method of Detecting Protozoal Cysts in Faeces by Means of Wet-Stained Preparations." *Lancet.* Vol. CXCII., No. 4885. 14th April 1917. Pp. 571-573.

FILDES, P. "The Technique of the Preparation of Culture Media Containing Albuminous Fluids." *Lancet.* Vol. CXCII., No. 4883. 21st March 1917. Pp. 492-493.

FLEISHER, M. S. "The Influence of Serum upon the Staining of Bacteria in Suspensions." *Journ. Med. Res.* Vol. XXXVI., No. 1. March 1917. Pp. 31-49.

Serum added to a mixture of bacteria and certain dilute basic stains, when present in one part in twenty-five, prevents the staining of the organisms. The stains used were neutral red, methylene blue, gentian violet, methyl green, and Bismarck brown. White of egg has a similar but weaker inhibitory action.

FROST, W. D. "Comparison of a Rapid Method of Counting Bacteria in Milk with the Standard-Plate Method." *Journ. Inf. Dis.* Vol. XIX., No. 3. September 1916. Pp. 273-287. 1 Chart, 6 Tables, 5 Figures.

Herein are discussed results obtained by the little-plate method already described by the author (*Science*, 1915, vol. xlvi. p. 255; *Journ. Amer.*

Med. Assoc., 1916, vol. lxvi. p. 899). By the method a comparatively low dilution of milk is made with nutrient agar, spread over a definite area on a microscopic glass slide, and incubated only until small colonies are visible under the microscope. The colonies are then rendered prominent by staining.

LOPEZ, C. L. "The Cultivation of *Bacillus mallei* in Broth and Potato-Agar" (El cultivo del bacillus mallei en caldo y en agar-patata). *Revista Hig. y Sanidad Pecur.* Vol. VII., No. 2. May 1917. Pp. 93-94.

This paper points out that an abundant growth of *B. mallei* may be obtained in twenty-four hours on potato-agar and in glycerinated potato broth.

TRIBONDEAU, L. "Distilled Water for Staining Purposes" (L'eau distillée pour colorations microscopiques). *C. R. Soc. Biol.* Vol. LXXX., No. 8. 21st April 1917. Pp. 388-389.

In order to obtain absolutely pure and neutral distilled water, such as is necessary in using the Laveran, Leishman, Giemsa, and other stains, Tribondeau adds 0·05 gramme of carbonate or oxide of silver to each litre of water, and then re-distils. The carbonate of silver may be conveniently obtained by adding 10 per cent. silver nitrate solution to 20 per cent. sodium carbonate solution until a precipitate ceases to be formed. The precipitate is washed thoroughly and used either fresh or dried. Oxide of silver is prepared in the same way, except that caustic potash is substituted for carbonate of sodium.

WILSON, W. J. "An Easily Improvised and Effective Method of Obtaining Plate Cultures of Anaerobes." *Lancet.* Vol. CXCII., No. 4889. 12th May 1917. Pp. 724-725. 2 Figures.

A simple and inexpensive device for which complete efficiency is claimed.

OBSTETRICS.

ALBRECHTSEN, J. "Sterility of Cattle and Methods of Treatment." *Cornell Veterinarian.* Vol. VII., No. 9. April 1917. Pp. 57-110. 3 Tables.

ANDERSEN, N. K. "Movements of the Foetus as an Aid in the Correction of Torsion of the Uterus" (Fosterbevaegelser Aarsag til Udrethning af Borslyngning). *Maanedskr. f. Dyrlaeger.* Vol. XXIX., No. 1. April 1917. Pp. 1-11.

COTTON, C. E. "Sterility in Cows, and Its Treatment." *Amer. Journ. Vet. Med.* Vol. XII., No. 4. April 1917. Pp. 223.

GIOVANOLI, G. "Goat-Breeding" (Aus dem Gebiete der Ziegezucht). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 4. April 1917. Pp. 193-210.

Discusses some pathological conditions associated with parturition.

LEWIT, J. C. "Cæsarean Section on a Brahmin Heifer." *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Australian Supplement. Pp. 15-16.

The case shows that the membranes can be left in the uterus for the time being; and, further that by inverting the edge of the wound, as in bowel suture, provisional union is strong enough to prevent leakage into the peritoneal cavity when decomposition of the membranes is set up.

MAHON, F. C. "Eclampsia in the Canine Species." *Vet. News.* Vol. XIV., No. 699. 26th May 1917. Pp. 210-212.

Mainly an abstract of a paper by Rouel (*Ann. Méd. Vét.*, February 1890).

SAND, G. "Treatment of Torsion of the Uterus in the Cow" (Om Behandlingen af Borslyngning hos Koen). *Maanedskr. f. Dyrlæger.* Vol. XXIX., No. 1. April 1917. Pp. 1-11.

SHAW, R. R. "Removing Retained Placentæ by Injecting Placental Vessels with Saline Solution." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 60-61.

PARASITOLOGY

(Including Entomology and Protozoology).

ALESSANDRINI, G. "Piroplasmoses: Their Prevention and Control" (Le piroplasmi ed i mezzi pre prevenirle e combatterle). *Annali d'Igiene.* Vol. XXVII., No. 2. 28th February 1917. Pp. 100-110.

A summary is given of the transmitting ticks of piroplasmosis and babesiosis, which may be tabulated as follows:—

PROTOZOON.

Piroplasma bovis.

TRANSMITTED BY

Margaropus (Boophilus) annulatus, Say.

Margaropus (Boophilus) decoloratus, Koch;
var. *calcaratus*, Neum.

Ixodes ricinus, L.

Ixodes hexagonus, Leach.

Hyalomma cæpticum, L.

Hæmaphysalis punctata, C. and F.

PROTOZOON.

TRANSMITTED BY

<i>Piroplasma parvum.</i>	<i>Rhipicephalus evertsi</i> , Neum. <i>Rhipicephalus simus</i> , Koch. <i>Rhipicephalus appendiculatus</i> , Neum. <i>Rhipicephalus capensis</i> , Koch. <i>Rhipicephalus nitens</i> , Neum.
<i>Piroplasma mutans.</i>	<i>Rhipicephalus simus</i> . <i>Rhipicephalus appendiculatus</i> . <i>Rhipicephalus evertsi</i> .
<i>Piroplasma ovis.</i>	<i>Rhipicephalus bursa</i> , C. and F.
<i>Piroplasma equi.</i>	<i>Rhipicephalus evertsi</i> <i>Margaropus annulatus</i> .
<i>Piroplasma canis.</i>	<i>Rhipicephalus sanguineus</i> , Latr. <i>Ixodes hexagonus</i> . <i>Ixodes ricinus</i> . <i>Hemaphysalis leachi</i> , Aud. <i>Dermacentor reticulatus</i> , F.

ALEXEIEFF, A. "Mitochondria and the Parabasal Body of Flagellates" (Mitochondries et corps parabasal chez les flagellés). *C. R. Soc. Biol.* Vol. LXXX., No. 7. 31st March 1917. Pp. 358-361. 1 Figure.

Reasons are given for assuming that the parabasal body should be considered as a formation of a mitochondrial nature. The kinetonucleus of bi-nucleate flagellates is the homologue of the parabasal body.

BODKIN, G. E., and CLEARE, L. D. "Notes on Some Animal Parasites in British Guiana." *Bull. Entom. Res.* Vol. VII. 1916. Pp. 179-190. 1 Map, 3 Figures.

Ankylostoma is common in dogs, *Physaloptera* and *Dicrocaelium* in cats, and *Echinoshynchus gigas* in pigs. Also lists of ticks, *Tabanidae*, fleas, bugs, lice and *Mallophaga*.

BOUET, G. "The Glossina Zones of Senegal" (Contribution à l'étude des zones à glossines du Sénégal (Région du chemin de fer de Thiès à Kayes)). *Bull. Soc. Path. Exot.* Vol. IX. December 1916. P. 802. 1 Chart.

Distribution of *Glossina morsitans*, which in this area conveys apparently only *Trypanosoma dimorphon*. The author discusses the possibility of introduction of *T. pecaudi* and *T. caazalboui* by the passage of numerous herds (especially of zebu) from Sudanese sources through the Thiès-Kayes area.

— and ROUBAUD, E. "Glossinas of the Ivory Coast" (Répartition des Glossines à la Côte d'Ivoire). *Bull. Soc. Path. Exot.* Vol. X. 1917. Pp. 37-39.

The Ivory Coast exhibits four principal *Glossina* zones characterized by

the predominance of certain species. These are, from south to north—(1) The zone of *Glossina palpalis* and *fusca*; (2) the zone of *G. pallicera*; (3) the zone of *G. longipalpis*; (4) the zone of *G. tachinoides*.

CHAMPETIER. "Treatment of Mange" (La traitement de la gale). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Vét. Méd.* 18th January 1917. Pp. 68-72.

CHOLODKOVSKY, N. "Avian Cysticercus" (Contribution à la connaissance des cysticerques d'oiseaux). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 219-222. 1 Figure.

COURMONT, J., and DURAND, P. "Ictero-Hæmorrhagic Spirochætosis in the Dog" (La spirochèteose icterohémorragique chez le chien). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 275-277.

Subcutaneous or intraperitoneal inoculation, or the ingestion of infective material, constantly produces a typical and fatal ictero-hæmorrhagic spirochætosis in the young dog.

CRAIG, J. F. "The Presence of Psoroptes in the Ears of Sheep." *Vet. Record.* Vol. XXIX., No. 1508. 2nd June 1917. Pp. 503-504.

CURLEWIS, A. "A Sheep Dip." *Journ. Dept. Agric., Victoria.* Vol. XIV., No. 11. November 1916. Pp. 694-698. 4 Figures.

Plans and description of a new form of dipping-tank are given.

DICKENSON, C. G. "A Case of Splenic Abscess, Secondary to Invasion of the Stomach Wall of the Horse by *Spiroptera megastoma*." *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Australian Supplement. Pp. 14-15.

The occurrence of *Spiroptera megastoma* in horses has been noted on various occasions, but this is the first case which has come under the writer's notice in which a splenic abscess has been found as a secondary infection.

FINZI, G., and CAMPUS, A. "Anaplasmosis. The Significance of Bodies Found in the Blood of Sheep from Sardinia and Piedmont" (Anaplasmosi. Sul significato dei "corpi endoglobulari," "punti marginali," "anaplasmi," trovati nel sangue degli ovini della Sardegna e del Piemonte). *Il Nuovo Ercolani.* Vol. XXI., Nos. 30-31. 31st October-10th November 1916. Pp. 493-500. *Ibid.* Nos. 34-35. 10th December-20th December 1916. Pp. 557-571. *Ibid.* Vol. XXII., Nos. 1-2. 15th January-31st January 1917. Pp. 2-8.

GRIMSHAW, P. H. "The British Lice (*Anoplura*) and Their Hosts." *Scottish Naturalist.* No. 61. January 1917. Pp. 13-17. No. 63. March 1917. Pp. 65-68.

This article gives the distinguishing features of genera. It includes the lice of the domestic animals.

— "A Guide to the Literature of British Diptera." *Proc. Roy. Phys. Soc., Edin.* Vol. XX., Part 2. March 1917. Pp. 78-117.

A list of 416 papers and other publications is given.

GUILLEBEAU, A. "Coccidiosis (*Eimeria stiedae* Lindemann) in the Dog" (Parasitischcs Vorkommen von *Eimeria stiedae* Lindemann in der Leber des Hundes). *Schweizer Arch. f. Tierheilk.* Vol. LVIII., No. 11. November 1916. Pp. 596-602. 6 Figures.

HADLEY, P. B. "The Part Played by the Goblet Cells in Protozoan Infections of the Intestinal Tract." *Journ. Med. Res.* Vol. XXXVI., No. 1. March 1917. Pp. 79-86. 1 Plate, 11 Figures.

In the case of the flagellate protozoan (*Trichomonas*), the cause of an acute disease of several species of birds—notably of "blackhead" in turkeys—the invasion of the subepithelial tissues is through the goblet cells of the intestinal glands.

HAYTHORN, S. R., and RYAN, A. H. "Aortic Aneurysms in Dogs, with the Report of Six Cases." *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 411-423. 2 Plates, 12 Figures.

HENRY. "Otacariasis and the Prophylaxis of Psoroptic Mange" (Otacariasis et prophylaxie des gales psoroptiques). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 41-48.

HERMES, W. B., and FREEBORN, S. B. "Pulmonary Strongylosis." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 862-868.

HORNBY, H. E. "Transmission of Cattle Trypanosomes by Flies other than Tsetse." *Rhodesia Agric. Journ.* Vol. XIV., No. 2. April 1917. Pp. 168-176. 1 Plate, 2 Figures.

LANE, CLAYTON. "The Genus *Ancylostoma* in India and Ceylon." *Ind. Journ. Med. Res.* Vol. IV., No. 1. July 1916. Pp. 74-92. 3 Plates.

The author describes and figures the chief characters of the members of this genus hitherto found in India and Ceylon. *A. duodenale* and *A. ceylonicum* occur in man, and the latter species and *A. caninum* are common in dogs. *A. malayanum* has been found only in the intestine of the Malay bear.

LÉPINAY, L. "Sulphur Fumes in the Treatment of Mange and Other Affections of the Skin" (Les gaz sulfureux. (1) Dans le traitement de la gale du cheval et autres affections de la peau ; (2) Dans les mesures préventives contre ces maladies et la désinfection générale). *Rev. Path. Comp.* Vol. XVII., No. 133. April 1917. Pp. (16) 80-(33) 97. 4 Figures.

LYMAN, R. P. "The Action and Control of Animal Parasites, with Special Reference to the Intestinal Canal." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 70-78.

MARKOFF, W. N. "Piroplasmosis, etc., in Domestic Animals in the Balkans" (Piroplasmose und andere blutparasitäre Krankheiten der Haustiere am Balkan). *Arch. f. Schiffs- und Tropen-Hygiene.* Vol. XX. 1916. Pp. 313-335. 5 Charts.

Piroplasmosis of horse, cattle and sheep, also an account of dourine (*Trypanosoma equiperdum*) in a stallion and two mares.

MAXFIELD, F. M. "Common Parasites of the Digestive Tract." *Amer. Journ. Vet. Med.* Vol. XII., No. 5. May 1917. Pp. 295-297.

In this paper there seems to be the further record of the occurrence of the giant nematode (*Dioctophyne renale*) in the dog. The author mentions that he found what he calls a *Strongylus gigas* in the abdominal cavity of a dog upon which he made a post-mortem examination in Tama, Iowa.

MAYALL, G. "Distomatosis, Liver Rot, or Fluke in Sheep." *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 91-94.

The author calls attention to the value of ethereal extract of male fern as a curative agent.

MOUSSU. "Treatment of Distomatosis" (Sur le traitement de la distomatose). *Rec. Méd. Vet.* Vol. XCIII., No. 6. *Bull. Soc. Centr. Méd. Vet.* 1st March 1917. Pp. 96-99.

The note calls renewed attention to the value of ethereal extract of male fern (minimum of 15 per cent. of the active principle) in the treatment of liver fluke. For a sheep of about 30 kilogrammes, 5 grammes of the extract should be given for five consecutive days in 20 or 30 grammes of oil.

The author thinks that, by means of a stronger extract, it may be possible to remove the parasites with two or three doses, or perhaps with one only.

PARKER, T. "Equine Sarcoptic Scabies in the Mouse." *Vet. Record.* Vol. XXIX., No. 1504. 5th May 1917. Pp. 459-461.

It is suggested that mice may be agents in the dissemination of scabies.

RÈNE, C. "Treatment of Mange in Horses" (Le traitement de la gale du cheval). *Progrès Agricole.* Vol. XXXI., No. 1522. 18th March 1917. Pp. 125-126.

ROBERT, A. E., and SANTON, B. "Bismuth in Fowl Spirillosis" (Action du bismuth sur la spirillose des poules). *Ann. Inst. Pasteur.* No. 6. 1916. Pp. 261-271.

Two successive intravenous injections of 10 milligrams of bismuth (in form of bismuth tartrate of sodium) per kilo weight of host thirty and forty-eight hours after the appearance of the spirochætes gave the best results.

ROUBAUD, E. "Pigs and the Perpetuation of Human Ectoparasites in the Tropics" (Les porcins et la conservation des ectoparasites humains dans les régions chaudes). *Bull. Soc. Path. Exot.* Vol. IX., No. 10. December 1916. Pp. 768-771.

— and VAN SACHEGHEM, R. "Insect and Acarian Parasites of Cattle in the Belgian Congo" (Observations sur quelques insectes et acariens parasites du bétail au Congo belge). *Bull. Soc. Path. Exot.* Vol. IX., No. 10. December 1916. Pp. 763-767.

An account of extensive observations on the occurrence of the insects and acari parasitic to cattle, etc., made at the Zambi Veterinary Station. It should be noted that stock-breeding was not carried on in this district until recently.

SPASAPINI, G. C. "Transmission of *Piroplasma ovis* in Three Pigs by the Digestive Tract" (Transmissione dell' infezione da *Piroplasma ovis* in tre suini per via digerente). *Pathologica.* Vol. IX., No. 196. 15th January 1917. Pp. 21-22.

Three pigs, ill when slaughtered, contained *P. ovis*. They had all eaten the flesh of sheep dying on the same farm. Nine sickly sheep on this farm were examined and found to be heavily infected with *P. ovis*, and the author concludes that the pigs became infected, by way of the digestive tract, through eating the flesh of infected animals which had been dead, in some cases, fifteen to eighteen hours.

STEWART, F. H. "Further Experiments on Ascaris Infection." *Brit. Med. Journ.* 7th October 1916. Pp. 486-488.

The author records the results of a further series of experiments (see this *Review*, No. 1, p. 33). The larvæ of *Ascaris lumbricoides* and *suilla* appeared in the bronchi, trachea, and mouth of the mouse and rat on the seventh to eighth day after these animals had been fed with mature eggs of the worms. The larvæ cannot live in tap-water, but can survive for twenty-four hours on damp bread and for forty-eight hours in fresh meat (rat's lung). The author's conclusion is that the larvæ will be found to migrate actively

in the saliva on to the food which is being nibbled by the rodent and the experiments strongly suggest that man is infected by contaminated food.

SWEET, G., and SEDDON, H. R. "The Viability of *Melophagus orinus* Linn., the Sheep Louse-Fly, Sheep Ked, or Sheep-'Tick.'" *Vet. Journ.* Vol. LXIII., No. 4. April 1917. Australian Supplement. Pp. 6-14. 3 Tables.

TAYLOR, F. H. "Sarcophaga froggatti—a New Sheep-Maggot Fly." *Bull. Entom. Res.* Vol. VII., No. 3. January 1917. P. 265.

An apparently new sheep-maggot fly, to which the above name has been given, was hatched out of fly-maggots from Queensland sheep.

TUTT, J. F. D. "Some Notes on Skin Disease of the Horse." *Vet. Record.* Vol. XXIX., No. 1504. 5th May 1917. Pp. 461-463.

Mange, ringworm, and lice are considered from the point of view of prevention and treatment.

VAN SACEGHEM, R., and NICOLAS, E. "Tartar Emetic in Trypanosomiasis" (L'émetique dans le traitement des trypanosomiases). *Bull. Soc. Path. Exot.* Vol. IX., No. 10. December 1916. Pp. 813-823.

A careful consideration of the trypanocidal action of tartar emetic with the results of observations *in vivo* and *in vitro*, and consideration of the treatment of trypanosomiasis.

WILLIAMS, G. H. "Sarcoptic Mange in the Ox." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 77-80. 3 Figures. Records the occurrence of sarcoptic mange in a bull and a heifer.

PATHOLOGY AND BACTERIOLOGY.

BARTLETT, C. J., and OZAKI, Y. "The Fate of *Micrococcus aureus* Introduced into the Blood-Stream of Dogs." *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 465-486.

Micrococcus aureus, when injected into the left ventricle of dogs, is almost immediately stored in great numbers in the lung capillaries, where it is rapidly ingested by polymorphonuclear leucocytes. Shortly after injection the cocci are stored in the liver and spleen, their presence in considerable numbers here being coincident with their decrease in the lung. They completely disappear from these organs within forty-eight to seventy-two hours. The cocci do not primarily lodge in the kidney in any considerable number. Their location here is probably not embolic.

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The cocci are found only in small numbers, or not at all, in the blood, bone marrow, lymph glands, intestinal wall, and skeletal muscle.

BLAKE, F. G. "The Classification of Streptococci." *Journ. Med. Res.* Vol. XXXVI., No. 1. March 1917. Pp. 99-133. 7 Tables.

The writer thinks a classification of distinct clinical value may be made as follows :—

1. *Streptococcus haemolysans*, characterised on blood-agar plates by colonies surrounded by a wide zone of haemolysis.

2. *Streptococcus viridans*, characterised by the formation of methæmoglobin or failure to alter blood and distinguishable from the pneumococcus by being bile insoluble. (a) *S. buccalis*, characterised by the fermentation of lactose and failure to ferment mannite. (b) *S. faecalis*, characterised by the fermentation of both lactose and mannite. (c) *S. equinus*, characterised by failure to ferment either lactose or mannite.

BROWNE, T. G. "Melanotic Sarcoma in a Mare." *Vet. Record.* Vol. XXIX., No. 1505. Pp. 471-472.

An account of the post-mortem findings in an aged grey mare.

CHAUSSÉ, P. "Pseudo-Tuberculosis of the Pig" (Pseudo-tuberculose du porc). *Rec. Méd. Vét.* Vol. XCII., No. 23. 15th December 1916. Pp. 679-682. 1 Figure.

EISENDRATH, D. N., and SCHULTZ, O. T. "The path of Involvement in Ascending Infection of the Urinary Tract." *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 295-335. 3 Plates (12 Figures), 1 Figure.

B. coli, *Staphylococcus aureus* and *B. proteus* were injected into the bladder of dogs. It was found that infection might spread to the kidney by way of a lymphatic network in the walls of the bladder and ureter. Evidence indicated that almost complete obstruction to the free passage of urine is necessary before infection spreads from the bladder to the kidney by the lumen of the urinary tract.

GAIR, G. "Streptotrichosis or Pseudo-Actinomycosis in Man" (Pseudo-tuberculosis). *Vet. Journ.* Vol. LXXIII., No. 3. March 1917. Pp. 96-100.

"The clinical symptoms in man, and also in animals experimentally inoculated with streptothrix, so resemble those of miliary tuberculosis that the question is naturally suggested whether there are really not more of these cases than the few reported as pseudo-tuberculosis would indicate."

HORT, E. C. "The Life-History of Bacteria." *Brit. Med. Journ.* No. 2904. 5th May 1917. Pp. 571-575. 6 Plates. 91 Figures.

BIBLIOGRAPHY—PATHOLOGY AND BACTERIOLOGY 343

KRUPSKI, A. "Pathology of the Female Sexual Organs of Cattle" (Beiträge zur Pathologie der weiblichen Sexual Organe des Rindes). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 5. May 1917. Pp. 257-273.

PETIT, G. "Cancer of the Thyroid Gland" (Le Cancer du corps thyroïde). *Rec. Méd. Vét.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 165-179. 12 Figures.

SARTI, C. "Adeno-Carcinoma of the Pancreas of the Dog" (Contributo allo studio dei tumori del pancreas nel cane). *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI., No. 1. 31st January 1917. Pp. 17-20.

STECK, W. "A Case of Endometritis Cystica Heterotopica in a Cow" (Ein Fall von Endometritis cystica heterotopica beim Rind). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 2. February 1917. Pp. 103-109.

The wall of the whole uterus of a fat cow was found invaded with a multitude of cysts varying in size up to 2 cm. in diameter. The cysts contained a clear watery fluid and a few calcareous particles, and were multilocular with smooth walls. They were evidently derived from the uterine glands.

TODD, L. C. "Comparative Study of *Bacillus anthracis-symptomatici* and Allied Organisms with Respect to Gas-Production." *Journ. Inf. Dis.* Vol. XX., No. 2. February 1917. Pp. 151-169. 5 Tables.

The fact that both the bacillus of symptomatic anthrax and that of malignant œdema produce gas when grown in carbohydrate-containing media suggested that this characteristic might be made use of in differentiation. *B. anthracis-symptomatici* produces more gas from dextrose, lœvulose, and maltose than *B. œdematis maligni*, and a greater proportion of this is carbon dioxide. Training of seed cultures influence the gas-production of these organisms considerably. Substances credited with the putrid odour are produced in cultures by strain members of both groups.

WALKER, I. C., and ADKINSON, J. "Studies on *Staphylococcus pyogenes aureus*, *albus*, and *citreus*, and on *Micrococcus tetragenus* and *M. catarrhalis*." *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 373-390. 5 Tables.

The authors have determined that *S. pyogenes aureus* and *albus*, and *Micrococcus tetragenus*, cannot be quickly differentiated except by agglutination tests with their respective immune sera. They are all Gram-positive; they all ferment the same sugars, and the pigment-production by *S. pyogenes aureus* may be very slow. *Staphylococcus pyogenes citreus* and *Micrococcus catarrhalis* ferment no sugars, and this, in addition to the pigment-production in the former and the Gram-negative staining of the latter, are sufficient for purposes of identification.

PHARMACOLOGY AND THERAPEUTICS.

BORY, L., and JACQUOT, A. "The Subcutaneous Introduction of Sulphur into the Organism" (De l'introduction du souffre dans l'organisme par la voie sous-cutanée). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 309-311.

COHN, A. E., and JAMIESON, R. A. "The Action of Digitalis in Pneumonia." *Journ. Exp. Med.* Vol. XXV., No. 1. January 1917. Pp. 65-81. 1 Plate, 7 Tables.

CUTLER, E. C., and ALTON, B. H. "The Control of Strychnin Convulsions by Intraspinal Injections of Magnesium Sulphate." *Journ. Exp. Med.* Vol. XXV., No. 1. January 1917. Pp. 83-92. 4 Tables.

DELAGE, Y. "Pharmacological Equivalents and Therapeutic Units" (Equivalents pharmacologiques et unités thérapeutiques : une réforme dans la manière de formuler). *C. R. Acad. Sci.* Vol. CLXIV., No. 12. 19th March 1917. Pp. 469-472.

The author suggests a new way of writing prescriptions to meet the difficulty in remembering the doses of the large number of new synthetic drugs. A list of all simple drugs and compounds should be drawn up and a number placed after each, this indicating the weight or volume of the average daily dose. This is the *pharmacological equivalent* (P. E.). To avoid the use of decimals a *therapeutic equivalent* (T. E.)—one-tenth of P. E.—would be taken as the unit. A model prescription is given.

DYKINS W. A., and JONES, R. P. "Experiments as to Toxicity of Certain Drugs Injected Intravenously, and the Action of the Same, if any, on Trypanosomes Causing Trypanosomiasis in German East Africa." *Vet. Record.* Vol. XXIX., No. 1500. 7th April 1917. Pp. 415-416.

The authors are not able to state definitely the minimum lethal dose of the medicaments used, but they feel satisfied that certain drugs hitherto considered quite unsuitable for intravenous medication can be quite safely administered, and experiments carried out on these lines might result in their effects being greater therapeutically than when administered *per orem*.

GOODRICH, H. P. "Glycerin and Antiseptics." *Brit. Med. Journ.* No. 2942. 19th May 1917. Pp. 647-648.

Seeing that antiseptics are much more soluble in glycerin than in water, there can be little doubt that more of these substances will dissolve in a mixture of glycerin and water than in pure water. The author, however, points out that, contrary to the assumption of pharmacologists, solutions in glycerin are not necessarily more antiseptic than aqueous solutions. On the contrary, her experiments show that they have a less bactericidal action.

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Observations on the time required to kill all the organisms from a standard culture of *Staphylococcus pyogenes aureus* contained in a thin film on a cover-glass, gave instructive results. For example, a 3·3 per cent. solution of phenol in water killed all the staphylococci in less than a quarter of a minute ; while the same strength of solution in water and glycerin required from one to five minutes. A 0·005 per cent. solution of mercuric chloride in water killed all the organisms in approximately a quarter of a minute ; but a 0·005 solution in water and glycerin required more than half a minute.

MACHT, D. I. "On the Pharmacology of the Ureter. IV., Action of Hydrastin, Hydrastinin, Cotarnin, Emetin, and some Pyridin Derivatives, with a further analysis of the Opium Action." *Journ. Pharmacol. and Expt. Therap.* Vol. IX., No. 6. March 1917. Pp. 287-303. 23 Figures.

The author has already shown that in their action on the isolated ureter of the pig the opium alkaloids may be divided into two groups, of which one is represented by morphin and the other by papaverin and narcotin. Further observations and experiments with the ureter of the pig lead to the general hypothesis that the inhibitory action of the papaverin group is due to their benzyl constituent, and that the stimulating action of the morphin group is due to their piperidin constituent.

MORRIS, M. "The Therapeutic Effects of Colloidal Preparations." *Brit. Med. Journ.* No. 2941. 12th May 1917. P. 617.

In this short preliminary note Sir Malcolm Morris indicates the great superiority of the collosol preparations of the Crookes' Laboratories over the same drugs in the non-colloidal form. As an example, collosol iodin is non-irritating and produces no stain. It may be given internally without fear of iodism. The collosol preparations act with singular rapidity, they are free from the disadvantages inseparable from the same drugs in the ordinary state, and their extensive use would effect an enormous economy in drug consumption.

MOTZFELDT, K. "Experimental Studies on the Relation of the Pituitary Body to Renal Function." *Journ. Expt. Med.* Vol. XXV., No. 1. January 1917. Pp. 153-188. 43 Figures.

QUITMAN, E. L. "Sodii Cacodylas (U. S. P. IX.): Sodium Cacodylate." *Amer. Journ. Vet. Med.* Vol. XII., No. 5. May 1917. Pp. 301-303.

WADDELL, J. A. "The Pharmacology of the Vagina." *Journ. Pharmacol. and Expt. Therap.* Vol. IX., No. 7. April 1917. Pp. 411-426. 14 Figures.

Experiments were conducted on the excised vaginæ of a number of animals of different species. Among other results, it was found that the

vaginae of rabbits, dogs, hogs, and sheep are stimulated by epinephrin, while those of cats, rats, guinea-pigs, and cows are depressed. Accordingly, the motor sympathetic innervation is the more powerful in the former species, and the inhibitory in the latter.

PHYSIOLOGY.

BUSQUET. "Action of Nucleinate of Sodium as a Renal Vaso-Constrictor" (*Action vaso-constrictive du nucléinate de soude sur le rein*). *C. R. Acad. Sci.* Vol. CLXIV., No. 5. 29th January 1917. Pp. 246-247.

In doses of $\frac{1}{20}$ milligramme per kilogramme of body weight nucleinate of sodium exercises a vaso-constrictor action on the kidney and does not sensibly affect other vascular territories. The action is upon the walls of the blood-vessels of the peripheral sympathetic ganglia, and takes place without the necessary intervention of the cerebro-spinal vaso-motor centres.

CUSHNY, A. R. "The Excretion of Urea and Sugar by the Kidney." *Journ. Phys.* Vol. LI., Nos. 1-2. March 1917. Pp. 36-44. 3 Tables.

"Urea and sugar are not excreted in the way which Heidenhain describes for the sulphindigotate of sodium, and all conclusions drawn from this analogy are erroneous. The site of secretion for urea and sugar therefore remains undetermined, and experiments on mammals offer no ground for supposing that it differs from that of the other constituents of the urine."

FLETCHER, W. M., and **HOPKINS,** F. G. "The Respiratory Process in Muscle and the Nature of Muscular Motion." *Proc. Roy. Soc.* Vol. LXXXIX., B, No. 619. 1st March 1917. Pp. 444-467. 7 Figures.

GITHENS, T. S. "A Comparative Study of Certain Actions of Adrenalin in the Cat and the Rabbit." *Journ. Exp. Med.* Vol. XXV., No. 2. February 1917. Pp. 323-332. 3 Plates, 1 Figure.

"The present investigation brought out the facts that the pupil of the cat is little affected by instillation of adrenalin, but shows, nevertheless, a greater responsiveness to adrenalin when given intravenously than does that of the rabbit, and that the duration of the dilatation effected by intravenous injection is, on the contrary, longer than in the rabbit.

"In regard to the vaso-constricting effect of adrenalin when administered intravenously, it was found that the intensity as well as the duration of the rise of blood-pressure was greater in the rabbit than in the cat."

IWANOW, E. "The Semen of Domesticated and Other Mammals" (Le processus d'éjaculation du sperme chez les animaux domestiques (cheval, chien)). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 230-233. (Le sperme de quelques mammifères.) *Ibid.* Pp. 233-235.

JEAN. "The Influence of Extracts of Genital Gonads on Phosphorus Metabolism" (De l'influence des extraits de glandes génitales sur le métabolisme phosphoré). *C. R. Acad. Sci.* Vol. CLXIV., No. 11. 12th March 1917. Pp. 438-440.

The injection of extract of the interstitial gland tissue of the testis and of the corpus luteum of the pig both cause a diminution in the phosphorus excreted.

JONES, F. WOOD. "The Relation of Structure to Function as Seen in a Mechanism of the Venous System." *Lancet* Vol. CXCII., No. 4885. 14th April 1917. Pp. 574-575. 1 Figure.

Herein is discussed the venous mechanism of the limbs.

KRUPSKI, A. "The Physiology of the Sexual Organs of Cattle" (Beiträge zur Physiologie der weiblichen Sexualorgane des Kindes). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 1. January 1917. Pp. 1-25.

LOEB, L., and HENSELBERG, C. "The Cyclic Changes in the Mammary Gland under Normal and Pathological Conditions. (1) The Changes in the Non-Pregnant Guinea-Pig. (2) The Changes in the Pregnant Guinea-Pig, the Effect of Lutein Injections, and the Correlation between the Cycle of the Uterus and Ovaries and the Cycle of the Mammary Gland." *Journ. Exp. Med.* Vol. XXV., No. 2. February 1917. Pp. 285-321.

These papers are too detailed for satisfactory abstraction, and should be read in the original by those interested in the mammary, uterine, and ovarian cycle.

MCLURE, C. W., VINCENT, B., and PRATT, J. H. "The Absorption of Fat in Partially and in Completely Depancreatised Dogs." *Journ. Exp. Med.* Vol. XXV., No. 3. March 1917. Pp. 381-403. 4 Tables.

MORSE, W. E. "The Relation of Acid to Gastric Discharge and Duodenal Regurgitation in the Dog." *Amer. Journ. Phys.* Vol. XLI., No. 4. October 1916. Pp. 439-448. 2 Charts, 2 Figures.

Water is discharged from the fasting stomach more rapidly than any percentage of acid. The rate of discharge is decreased with increase of acidity. Duodenal regurgitation often occurred at 0·2 per cent. acidity, and in nearly all trials occurred at or before 0·3 per cent. acidity was reached.

Increase in acidity increases the frequency and amount of regurgitation from the duodenum.

PALMER, C. C. "The Diastase in the Saliva of the Ox." *Amer. Journ. Phys.* Vol. XLI., No. 4. October 1916. Pp. 483-491.

Saliva of the ox contains a starch-splitting enzyme or enzymes, which varies in amount in individuals, and at different times in the same individual. This enzyme or enzymes is not a specific constituent of the saliva but comes from the blood which contains similar enzymes in much higher concentration. This enzyme or enzymes is unimportant as far as its digestive ability is concerned.

POULTRY DISEASES.

GOLDBERG, S. A. "A Study of the Fermenting Properties of *Bact. pullorum* Rettger and *Bact. sanguinarium* Moore." *Journ. Amer. Vet. Med. Assoc.* Vol. II., No. 2. May 1917. Pp. 203-210.

RETTGER, L. F., and KOSER, S. A. "A Comparative Study of *Bacterium pullorum* Rettger and *Bacterium sanguinarium* Moore." *Journ. Med. Res.* Vol. XXV., No. 3. January 1917. Pp. 443-458. 8 Tables.

SMITH, T. "Some Field Experiments Bearing on the Transmission of Blackhead in Turkeys." *Journ. Exp. Med.* Vol. XXV., No. 3. March 1917. Pp. 405-414. 1 Table.

Healthy turkeys may be raised in the incubator from eggs of infected birds. The infection is either not transmitted at all or only under exceptional circumstances by turkeys in the early acute stage. It is probably carried and shed by birds which have passed through an attack. Experiments to show whether poultry transmit the protozoa were negative but not conclusive.

SEROLOGY AND IMMUNOLOGY.

BASINGER, H. R. "The Alleged Detoxicating Power of the Thyroid Gland." *Journ. Inf. Dis.* Vol. XX., No. 2. February 1917. Pp. 131-139. 2 Tables.

In 1902 Remedi (*Sperimentale*, vol. lvi. p. 500) reported that the injection of extracts of killed cultures into the thyroid averted or ameliorated the symptoms produced by the subcutaneous injection of these cultures. From experiments on the dog, Basinger concludes that the thyroid gland has no detoxicating properties that can be demonstrated by the injection of diphtheria and tetanus toxin directly into the gland.

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BERG, W. N. "Transformation of Pseudo-Globulin into Euglobulin." *Journ. Agric. Res.* Vol. VIII., No. 12. 19th March 1917. Pp. 449-456.

BEVAN, L. E. W. "Immunity in Its Relation to the Stock Diseases of Southern Rhodesia." Parts II. and III. *Rhodesia Agric. Journ.* Vol. XIII., No. 6. December 1916. Pp. 800-812. 2 Plates, 5 Figures. *Ibid.* Vol. XIV., No. 2. April 1917. Pp. 213-234. 2 Plates, 4 Figures.

FERRY, N. S. "Desiccated Anthrax Antigen for Immunisation Purposes." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 200-203.

While the spore vaccine in suspension used in Russia, Hungary, and Japan, and advised by Eichhorn (*Bull. No. 340. United States Dept. Agric.*) and others, has a distinct advantage over Pasteur's vaccine, it also has its faults. It is evident that the ideal would be a spore vaccine in a desiccated state. The author has prepared such a vaccine by a method similar to that used in the preparation of a spore vaccine in suspension, except that the growth of anthrax bacilli is scraped off the agar, diluted sufficiently for standardisation, and dried at room temperature.

FRANKLIN, O. M., and HASLAM, T. P. "The Strength and Composition of Blackleg Vaccines." *Journ. Inf. Dis.* Vol. XIX., No. 3. September 1916. Pp. 408-415. 1 Table.

A record of experiments undertaken to determine, if possible, the fundamental reason for so many unsatisfactory results from the use of blackleg vaccine.

HADWEN, S., and BRUCE, E. A. "Anaphylaxis in Cattle and Sheep Produced by the Larvæ of *Hypoderma bovis*, *H. lineatum*, and *Cestrus ovis*." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 15-41. 15 Figures.

HARDENBERGH, J. B., and BOERNER, F. "Vaccinations against Hemorrhagic Septicemia, No. 2." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 868-876. 2 Tables.

The authors have already reported on their vaccination work against bovine haemorrhagic septicæmia (*Journ. Amer. Vet. Med. Assoc.*, April 1916, vol. xlix., No. 1). The present communication outlines the results of a continuation of the vaccination in the year 1916, during which period 431 animals were vaccinated in thirty-one herds. The authors use a living vaccine consisting of forty-eight-hour bouillon cultures of *B. bovissepticus* isolated from outbreaks of haemorrhagic septicæmia, with which no special measures have been taken to attenuate.

The work is to be continued.

350 BIBLIOGRAPHY—SEROLOGY AND IMMUNOLOGY

HEALY, D. J., and GOTTLIEB, E. J. "The Attenuation of Hog-Cholera Virus." *Journ. Inf. Dis.* Vol. XIX., No. 4. October 1916. Pp. 569-571.

A limited number of experiments appear to show that "the virus of hog cholera on incubation with hyperimmune blood for forty-eight hours at 37° C. is so modified that when injected it will no longer render normal hogs sick, but will protect them when later they are exposed to cholera. We may further conclude that the virus of hog cholera on incubation with normal rabbit serum for forty-eight hours at 37° C. is modified to the extent that one of three animals was protected against cholera."

HOMER, A. "On Factors Limiting the Extent of the Concentration of Antitoxic Sera by the Fractional Precipitation Methods at Present Employed." *Journ. Hygiene.* Vol. XV., No. 4. February 1917. Pp. 580-590. 6 Tables.

By the fractional precipitation methods at present employed for the concentration of antitoxic sera for therapeutic use the degree of concentration of high potency cannot be taken beyond the limit of about 22,500 units of antitoxin per gramme of protein in the end product.

MAGAZZARI, A., and ERRANI, L. "The Conglutination Test for Glanders" (La prova della conglutinazione nella diagnosi della morva). *Il Moderno Zootrofo.* Parte Sci. Ser. V., Vol. VI., No. 1. 31st January 1917. Pp. 1-6.

POYARKOFF, E. "The Inactivation of the Complement in a Medium Poor in Salts" (Sur l'inactivation du complément dans un milieu pauvre en sels). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 227-228.

The inactivation is not of a fermentative nature, but is due to more or less aggregation of the particles of the complement.

— "The Relationship between Haemolysin and Spermotoxin" (Sur la parenté entre l'hémolysine et la spermotoxine). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 229-230.

Poyarkoff believes it would be useful to bring haemolysin and spermotoxin more into line by calling the latter *spermolysin*. This name has been used already by some authors (London), but has not received universal acceptance.

— "The Application of the Law of Schulze to the Complement" (Sur l'application de la règle de Schulze au complément). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 239-241.

Poyarkoff concludes that the complement is very probably of the nature of a lipoid. Among lipoids, lecithin does not obey the law of Schulze.

while cholesterin does. In this respect, therefore, the complement approaches cholesterin more closely than it does lecithin.

PRIESTLEY, H. "The Mechanism of the Agglutination Reaction." *Journ. Hygiene*. Vol. XV., No. 4. February 1917. Pp. 485-504. 15 Tables.

SHILSTON, A. W. "Rinderpest. Preparation of Antiserum." *Bull. No. 64*. Agric. Research Institute, Pusa. 1916. Pp. 18.

SIMONDS, J. P. "Anaphylactic Shock in Dogs." *Journ. Inf. Dis.* Vol. XIX., No. 6. December 1916. Pp. 746-753. 2 Charts.

WEHRBEIN, H. "Agglutinins in Hog-Cholera Immune Serum for *Bacillus suispestifer*." *Journ. Inf. Dis.* Vol. XIX., No. 3. September 1916. Pp. 446-451. 3 Tables.

The paper presents tabulations of the agglutinins for *B. suispestifer* in 100 hog-cholera immune sera, in eight sera of virus pigs, and in eight sera of normal pigs; also the report of an experiment to ascertain the connection between the agglutinin titre for *B. suispestifer* and the amount of virus antibodies in a hyperimmune serum.

SURGERY.

ACHARD, C., and LEBLANC, A. "The Action of Soap Solution Used in the Dressing of Wounds" (Sur le mode d'action des solutions de savon employées pour le pansement des plaies). *C. R. Soc. Biol.* Vol. LXXX., No. 8. 21st April 1917. Pp. 395-397.

The authors conclude that the main effects of soap solution is produced by the liquefaction of pus and coagulated albumen. In addition, the solution has a slight bactericidal action.

BEMIS, H. E. "Local Anæsthesia in Animal Dentistry." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 188-192. 3 Figures.

The author uses a 5 per cent. solution of alypin in Ringer's solution, and gives directions whereby the nerves at the maxillary and mandibular foramina may be reached by a hypodermic needle (No. 20 gauge, about 10 cm. in length). He injects 4 or 5 c.c. of the solution. He has injected as much as 10 c.c. without toxic effect. To prolong the anæsthesia a few drops of adrenalin chloride ($1\text{ in }1000$) should be added to the injection.

CARY, C. A. "Abdominal Hernias." *Journ. Amer. Vet. Med. Assoc.* Vol. L., No. 7. March 1917. Pp. 823-830. *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. Pp. 149-152.

COLLAS, S., and SAINT-CALBRE, R. "The Spaying of Bovines in Argentina" (La castration des femelles bovines en Argentine). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 58-63.

DOUGLAS, S. R., FLEMING, A., and COLEBROOK, L. "Studies in Wound Infection: On the Question of Bacterial Symbiosis in Wound Infections." *Lancet.* Vol. CXCII., No. 4886. 21st April 1917. Pp. 604-607. 9 Tables.

These experiments show that streptococci multiply much more rapidly when grown in symbiosis with various bacteria, among these being the group of diphtheroid bacilli which are present in practically every infected wound from the earliest stages until cicatrisation is complete.

DRAGSTEDT, L. R., MOORHEAD, J. J., and BURCKY, F. W. "Intestinal Obstruction: An Experimental Study of the Intoxication in Closed Intestinal Loops." *Journ. Exp. Med.* Vol. XXV., No. 3. March 1917. Pp. 421-439. 5 Figures.

EAKINS, H. S. "Chlor-Antiseptics." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 221-229.

Students of comparative medicine are at this time more or less interested in the Carrel wound treatment method, and no doubt its use would be more extensively applied by veterinarians were they more acquainted with the antiseptic employed. The paper contains formulæ and instructions for the preparation of Dakin's solution and various modifications thereof.

FERLINI, A. "On the Cause of Fracture of the Base of the Skull in Solipeds" (Considerazioni sulla genesi di alcune fratture della base del cranio nei solipedi). *Il Moderno Zootiatro.* Parte Sci. Ser. V., Vol. VI., No. 3. 31st March 1917. Pp. 53-60. 4 Figures.

FULSTOW, H. "Nymphomania of Mares." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 1. April 1917. Pp. 45-51.

Cases are divided into three classes as follows:—(1) Mares that are "mean" when in heat only, and those that are in heat continually, but do not kick. All will be cured by ovariotomy. (2) Mares that kick nearly all the time, whether in oestrus or not. Some will be cured by ovariotomy, others will be benefited, and, in a few instances, the operation will do no good. (3) Old mares that have kicked for years, and the habit has become confirmed, and those that kick all the time when not in heat, but are gentle when in heat. These, as a rule, will not be at all benefited by the operation.

GRAY, H. "Some Surgical Conditions Encountered in Canine Practice." *Vet. Record.* Vol. XXIX., No. 1503. 28th April 1917. Pp. 447-452.

GUILLAUME, A., and BITTNER, G. "The Treatment of Wounds by the Polyclonal Serum of Leclainche and Vallée" (Le traitement des plaies par le sérum polyvalent des professeurs Leclainche et Vallée). *Rev. Gén. Méd. Vét.* Vol. XXVI., Nos. 302-303. March 1917. Pp. 67-79.

HANCOCK, R. C. G. "A Graphic Method of Recording Lameness." *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 162-164. 3 Figures.

"This method depends on the observable fact that the degree of lameness evinced by a horse is reflected in the pattern made by his hoofs in trotting over soft ground." It is hoped to publish later a series of cases recorded graphically by this method.

HEPWORTH, F. A. "Toxic Symptoms after the Use of Bismuth Paste." *Lancet.* Vol. CXCII., No. 4885. 14th April 1917. Pp. 573-574.

Hepworth describes symptoms, resembling those of plumbism, occurring in cases treated with the above paste.

HUGHES, J. "Disease of the Carpus." *Amer. Journ. Vet. Med.* Vol. XII., No. 5. May 1917. Pp. 292-294.

INGLIS, T. M. "Remarks on the Écraseur in Practice." *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Pp. 131-135.

The author deals with the advantages of the instrument in castration.

LECLAINCHE, E., and VALLEE, H. "The Specific Serum Treatment of Wounds" (Le traitement sérique spécifique des plaies et des infections consécutives). *La Presse Méd.* Vol. XXV., No. 19. 2nd April 1917. Pp. 187-189.

Previous papers have appeared in *C. R. Acad. Sci.* (March 1912, vol. cliv. p. 636), *Bull. Acad. Méd.* (23rd February 1915, p. 280), and *Rev. Gén. Méd. Vét.* (1916, vol. xxv. p. 306). (See this *Review*, Vol. I. p. 51.)

The present paper summarises the theory of the action of a polyclonal serum, obtained from hyperimmunised horses, on infected wounds, and defines the possibilities of its application.

The polyclonal serum may be used (1) as a local application for infected wounds; (2) as a subcutaneous injection. Special ampoules containing 10 c.c. can be obtained for this purpose.

The subcutaneous injection, either alone or combined with local use, has been found of great value in combating infections and toxic complications following extensive traumatism. Quénou (*Bull. Soc. Chir.*, 1916, pp. 1832 and

2784) and Delbet (*Bull. Soc. Chir.*, 1916, p. 2793) have recently testified to the value of the serum administered subcutaneously.

On the use of the serum in veterinary practice, see Guillaume and Bittner (*Rev. Gén. Méd. Vét.*, 1917, vol. xxvi. p. 67) and Chouleur (*Bull. Soc. Centr. Méd. Vét.*, 1st March 1917, p. 116). (See this *Review*, Vol. I. p. 286.)

MATHESON, J. A. "Remarks on the Surgical Treatment of 'Quittor.'" *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 155-161. 2 Figures.

A synoptical account of 123 cases upon which operation has been performed. Twenty-four of the horses have been destroyed.

MOREL, P., and LE PAGE, V. "Filiform Drainage in Veterinary Work" (*Le drainage filiforme en médecine vétérinaire*). *Rec. Méd. Vét.* Vol. XCII., No. 24. *Bull. Soc. Centr. Méd. Vét.* 7th December 1916. Pp. 389-392.

The authors strongly recommend the drainage of wounds, hygromas, quittors, abscesses, etc., with horse-hair (from the tail) which has been soaked for some hours in a concentrated antiseptic solution (permanganate or cresyl). Each drain consists of from four to ten hairs, and is moved in the wound several times daily. In order to introduce the drains the authors mostly use a straight or curved needle.

MOUSSU, R. "Treatment of 'Quittor' at the Front" (*Sur le traitement du javart cartilagineux sur le front*). *Rec. Méd. Vét.* Vol. XCIII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 72-74.

PEARSON, W. "Important Principles in the Drainage and Treatment of Wounds." *Lancet*. Vol. CXCII., No. 4882. 24th March 1917. Pp. 445-449.

POLICARD, A., and DESPLAS, B. "Microscopic Foreign Bodies Tolerated in Wounds" (*Les corps étrangers microscopiques tolérés dans les plaies. Réactions qu'ils provoquent dans les tissus*). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 175-177.

From their observations as military surgeons the authors have found that microscopic foreign bodies, such as fragments of clothing, pieces of wood, etc., are perfectly tolerated by the tissues. Though the foreign bodies are septic, they neither produce inflammatory reaction nor interfere with the normal process of healing. The tissue reaction is confined entirely to the formation of giant cells, which are produced by the fusion of hypertrophied and proliferating connective tissue cells. There is frequently, but not constantly, a collection of eosinophile cells.

POLICARD, A., and DESPLAS, B. "Absence of Lymphatic Vessels in the Granulation Tissue of Wounds" (*Absence de vaisseaux lymphatiques dans le tissu de bourgeonnement des plaies*). *C. R. Soc. Biol.* Vol. LXXX., No. 6. 17th March 1917. Pp. 286-287.

Healing muscular wounds have been injected interstitially with osmopicric-silver according to the classic technique of J. Renaud, and there has been no evidence of lymphatic capillaries.

QUERY, L. "Microbes Become Accustomed to Antiseptics" (*À propos de l'accoutumance des microbes aux antiseptiques*). *Rer. Path. Comp.* No. 131. February 1917. Pp. 7-9.

The author points out that, just as a particular internal medicament may lose its effect after continued use, so a particular antiseptic may become less efficacious.

ROBERTS, G. A. "Oophorectomy for Nymphomaniac and Ticklish Mares." *Amer. Journ. Vet. Med.* Vol. XII., No. 3. March 1917. Pp. 145-147.

SALVISBERG, A. "Treatment of Fracture of the Femur of the Dog" (*Beitrag zur Behandlung der Femurfraktur des Hundes*). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 2. February 1917. Pp. 92-97. 2 Figures.

The correct application of a dressing being a matter of difficulty, the immobilisation of the animal as a whole is recommended. After four or five weeks the fracture is generally so far healed that the dog may then be permitted some amount of movement.

SCHWENDIMANN. "Broken-knees" (*Sturzwunden und Sturznarben*). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 1. January 1917. Pp. 25-30.

For immediate dressing are mentioned the almost forgotten white-lead ointment, gelatina glycerinata zinci dura, Schindelka's varnish (zinci oxydatum five parts, oleum ricini five parts, and collodion forty parts), coagulated albumen, and 10 per cent. solution of silver nitrate. The radical elimination of the scar of "broken knees" by transplantation is discussed.

SMYTHE, R. H. "Canker of the Foot and Its Treatment." *Vet. News.* Vol. XIV., No. 693. 14th April 1917. Pp. 148-149.

Attention is called to a condition of the "ergot" associated with "canker" of the foot, apparently an intermediate stage between "grease" and "canker." A line of treatment of "canker" is suggested which should suffice for the cure of comparatively severe cases in four weeks.

VINCENT, H. "A Comparative Study of Various Antiseptic Agents" (*Sur la prophylaxie de l'infection des plaies de guerre. Étude comparée de divers agents antiseptiques*). *C. R. Acad. Sci.* Vol. CLXIV., No. 3. 15th January 1917. Pp. 153-156.

TERATOLOGY.

BROWNE, T. G. "Anomaly of a Valve in the Heart of a Horse." *Vet. Record.* Vol. XXIX., No. 1504. 5th May 1917. P. 463. 1 Figure.

The pulmonary semilunar valve consisted of only two cusps, which were about equal in size.

MARCENAC. "Anomaly of the Right Naso-Lachrymal Duct in a Horse" (Curieuse anomalie du canal lacrymal droit chez un cheval). *Rec. Méd. Vet.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 199-202.

TOXICOLOGY.

BROWN, H. B. "Life History and Poisonous Properties of *Clariceps paspali*." *Journ. Agric. Res.* Vol. VII., No. 9. 27th November 1916. Pp. 401-406. 1 Plate (6 Figures), 2 Text-Figures.

BUCKLEY, J. S., and SHIPPEN, L. P. "Preliminary Report on the Relation of Anaerobic Organisms to Forage Poisoning." *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 809-816.

BURMEISTER, W. H., and McNALLY, W. D. "Acute Mercury Poisoning: A Parallel Histological and Chemical Study of the Renal and Hepatic Tissue Changes as Compared with the Rapidity of Absorption and the Amount of Mercury Present in the Circulating Blood at the Time such Changes Occur." *Journ. Med. Res.* Vol. XXXVI., No. 1. March 1917. Pp. 87-98. 1 Chart.

GLOVER, G. H. "The Whorled Milkweed" (*Asclepias verticillata*). *Amer. Journ. Vet. Med.* Vol. XII., No. 5. May 1917. P. 303.

Though the author's experiments seem to point to the non-poisonous properties of the plant, the circumstantial evidence pointing to the toxicity of the whorled milkweed continues to accumulate.

GRAHAM, R., and HIMMELBERGER, L. R. "Studies in Forage Poisoning." IV. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 164-187. 6 Plates (18 Figures), 5 Charts.

LOCKETT, S. "Sheep Poisoned by Western Golden-Rod (*Solidago spectabilis*)."
Journ. Amer. Vet. Med. Assoc. Vol. LI., No. 2. May 1917. Pp. 214-221.

TUBERCULOSIS.

BRUSCHETTINI, A. "Vaccination against Bovine Tuberculosis" (La vaccination des bovidés contre la tuberculose). *Rer. Path. Comp.* No. 131. February 1917. Pp. 5-6.

CHAUSSE, P. "The Virulence of Muscle and Apparently Healthy Lymph Gland in Generalised Tuberculosis of the Ox and Pig" (Recherches sur la virulence du muscle et des ganglions apparemment sains dans la tuberculose généralisée du bœuf et du porc). *Ann. Inst. Pasteur.* Vol. XXXI., No. 1. January 1917. Pp. 1-18.

COHEN, M. SOLIS. "Hyper-Sensitiveness to Tuberculin as Determined by Intracutaneous Injection of Different Dosages." *Journ. Inf. Dis.* Vol. XX., No. 3. March 1917. Pp. 232-243. 6 Tables.

DUERST, U. "Tuberculosis" (Tuberkulose und Tierzucht). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 2 February 1917. Pp. 65-91. *Ibid.* No. 3. March 1917. Pp. 154-173. 3 Charts.

GUIEYSEE-PELLISSIER, A. "On the Formation of Giant Cells in Tuberculosis" (Note sur la formation des cellules géantes dans la tuberculosis par caryoanabiose). *C. R. Soc. Biol.* Vol. LXXX., No. 4. 17th February 1917. Pp. 187-189.

LEWIS, P. A. "The Influence of Certain Organic Substances on the Growth of the Tuberclle Bacillus." *Journ. Exp. Med.* Vol. XXV., No. 3. March 1917. Pp. 441-459. 6 Tables.

It was found that a large number of anilin dyes have the power to restrain the growth of *B. tuberculosis* and *B. typhosus* *in vitro*. This capacity to restrain growth of the tubercle bacillus apparently bears no simple relation to true disinfectant action.

— "Observations Bearing on the Possibility of Developing an Experimental Chemotherapy of Tuberculosis." *Bull. Johns Hopkins Hosp.* Vol. XXVIII., No. 313. March 1917. Pp. 120-124.

M'FADYEAN, J. "Tuberculous Mastitis in the Cow: Its Pathogenesis and Morbid Anatomy and Histology." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 57-77. 2 Plates, 15 Figures. To be continued.

MASON, F. E. "Tuberculosis in Camels." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 80-84.

MILLER, A. H. "On the Bio-Chemistry of the Loss of Power of the Tubercl Bacillus to Stain with Carbol-Fuchsin." *Journ. Path. and Bact.* Vol. XXI., No. 1. December 1916. Pp. 41-46. 1 Plate.

The variations in the staining power of the tubercle bacillus to carbol-fuchsin on sperm and olive-oil media depends upon the production of free oleic acid in its interior ; the free acid being formed by the round granules, or spores, of the organism.

RAPPIN. "Anti-Tuberculous Vaccination" (Vaccination antituberculeuse). *C. R. Acad. Sci.* Vol. CLXIV., No. 10. 5th March 1917. Pp. 421-422.

Good results are reported as having been obtained by the use of a vaccine prepared as follows :—Tubercle bacilli, from bouillon cultures of different ages, are desiccated for twenty-four hours, and then treated with a 2 or 3 per cent. solution of fluoride of sodium for several days. This results in the loss of infective power with the retention of toxic properties. The bacilli are then washed with physiological solution, and submitted for a longer or shorter period to the action of an antituberculosis serum which produces disintegration of the organisms. This emulsion of bacilli and serum constitutes the vaccine.

TAKEOKA, M. "The Treatment of Experimental Tuberculosis in Guinea-Pigs and Rabbits with Taurin, Alone and in Combination with Gold Chloride and Sodium Oleate." *Journ. Inf. Dis.* Vol. XX., No. 4. April 1917. Pp. 442-456. 6 Tables.

WANG, CHUNG YIK. "The Incidence of Bovine Infection of Tuberculosis in Children." *Edin. Med. Journ.* Vol. XVIII., No. 3. March 1917. Pp. 178-196. 9 Tables, 3 Diagrams.

WILLIAMS, R. S., SCOTT, W. M., ROBERTS, T., and HOY, W. A. "Presence of Tubercl Bacilli in the Faeces of Cattle in Dairy Herds." *Vet. News.* Vol. XIV., No. 695. 28th April 1917. Pp. 171-173. *Ibid.* No. 696. 5th May 1917. Pp. 180-184. 2 Charts, 1 Table.

VETERINARY REVIEW.

ABSTRACTS.

ANATOMY

(Including Embryology and Histology).

MORPHOLOGY OF NORMAL PIGS' BLOOD. C. C. PALMER. *Journ. Agric. Res.* Vol. IX., No. 5. 30th April 1917. Pp. 131-140. 4 Tables.

EFFECTS OF MUSCULAR EXERCISE AND THE HEAT OF THE SUN ON THE BLOOD AND BODY TEMPERATURE OF NORMAL PIGS. C. C. PALMER. *Journ. Agric. Res.* Vol. IX., No. 4. 7th May 1917. Pp. 167-182. 4 Tables, 2 Graphs.

"Twenty-five examinations were made of the blood of normal pigs between the ages of two and forty-two days. . . . The average number of erythrocytes was 3,855,000 per c.mm., and 13,500 leucocytes per c.mm. The average clotting time was sixty-four seconds, specific gravity 1·024, and the average haemoglobin percentage 56·8. Differential count of leucocytes showed the following:—Lymphocytes, 63·25 per cent.; polymorphs, 32·14 per cent.; mononuclears, 2·63 per cent.; eosinophiles, 1·28 per cent.; mast cells, 0·24 per cent."

"Twenty-five examinations were made upon the blood of pigs weighing in the neighbourhood of 100 lbs. . . . The average number of erythrocytes per c.mm. was 6,215,000, and the average number of leucocytes per c.mm. was 18,000. The average clotting time was 57·60 seconds, specific gravity 1·062, and the average haemoglobin percentage was 79·4. The differential count of leucocytes showed the following:—Lymphocytes, 55·21 per cent.; polymorphs, 39·79 per cent.; mononuclears, 0·79 per cent.; eosinophiles, 3·42 per cent.; mast cells, 0·79 per cent."

A detailed description of the various classes of leucocytes is given.

It is evident that the number of red blood corpuscles varies with age and the condition of the animal. The number is lower in the young, and in animals of the same age in poor condition. Sex has little influence on the number of erythrocytes.

The leucocyte count showed considerable variation, but seems to be lower in young animals and in females.

The percentage of haemoglobin was higher in old animals and in males. The specific gravity was higher in the older animals. The clotting time was less in younger animals.

As will be noticed above, the author recognises five classes of leucocytes: namely, lymphocytes, large mononuclear, polymorphonuclear, eosinophile, and mast cells. The results of his differential leucocyte counts are fairly uniform with those of various previous observers. Lymphocytes and large mononuclear leucocytes were more numerous in young animals; while older animals had a higher percentage of polymorphonuclear and eosinophile leucocytes and mast cells. The sex does not appear to have any influence on the differential leucocyte count.

During the research, the results of which are given in the first paper, it was noticed that lying in the sun produced certain changes in the body temperature and the clotting time of the blood. This led to a further research, as described in the second paper.

Although it is well established that exercise in man causes an increase in the number of red blood corpuscles, this is apparently not the case in the pig. The evidence afforded by the pig tends to confirm the theory that perspiration is responsible for the increase in the number of erythrocytes in man.

Muscular exercise in the pig is usually followed by a leucocytosis and marked changes in the differential leucocyte count. The mono-nuclear elements are decreased and the polymorphonuclear leucocytes are increased. The leucocytosis is probably the result of muscular exercise forcing leucocytes into the general circulation from the tissues. Exposure to the sun causes similar changes in the differential count.

Both muscular exercise and heat of the sun lead to a marked increase in body temperature, which is more pronounced in fat pigs than in lean ones.

Increased atmospheric temperature and increased humidity of the atmosphere lead to increased body temperature.

The results of these observations have a bearing on the value of clinical records.

THE NORMAL PRESENCE OF OSSEOUS PLATES OR CARTILAGINOUS ISLANDS IN THE WALL OF THE AORTA OF BOVINES (Sulla presenza nei bovini adulti di placche ossee o di isole cartilaginee nello spessore dell' aorta primitiva in condizioni normali). Z. Prospero. *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI., No. 4. 30th April 1917. Pp. 81-104. 6 Figures.

The author has been struck with the frequent occurrence of osseous plates or cartilaginous islands in the wall of the aorta of the ox close to the attachment of the semilunar valves. As is known, the attached margin of the semilunar valve of the ox is reinforced, and fibres from the reinforcement course in an arched manner into the substance of the valve. It is in the neighbourhood of the reinforcement that the bony or cartilaginous formations are found. There is no indication of affection of the intima or of any other pathological process, either to the naked eye or in specially prepared microscopic sections.

CLINICAL.

ŒSOPHAGEAL SPASMS IN COLTS. R. R. BOLTON. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 876-879.

Herein is described the case of a nine-months' old colt which, in 1916, evinced symptoms of intermittent inability to swallow. The owner reported that the animal had been seen to lower his head and discharge a large quantity of saliva from the nostrils and mouth. The act was repeated at short intervals for ten to fifteen minutes, when the colt suddenly recovered and appeared normal. The attacks were irregular in their occurrence. There might be several attacks a day, or two or three days might elapse with only one or two short seizures.

Cough could be induced by pressure over the first three rings of the trachea. Ascarides were passed with the faeces. After treatment with an anthelmintic the animal was discharged from the hospital, but was returned in a few days because the attacks were so frequent that he could neither eat nor drink. The stomach tube was passed with little difficulty, but on trying a second time a spasm was induced about 10 ins. beyond the pharynx. Without any treatment the spasms ceased.

During the present year Bolton has been told that similar spasms have been observed in a seven-months' colt, full brother of the animal whose case forms the subject of the communication.

The occurrence of oesophageal spasm is very rare in animals, few cases being recorded in veterinary literature. The fact that two brothers were affected suggests a hereditary family trait.

DIFFUSE LEIOMYOMA AND RUPTURE OF THE STOMACH (*Leiomyome diffus de l'estomac et rupture consécutive de l'organe*). COCU.
Rec. Méd. Vét. Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 142-147. 2 Figures.

Though tumours of smooth muscle are relatively frequent in man, a reference to veterinary literature seems to indicate that this is not so in the domestic animals. It is probable, however, that cases are more common than is generally supposed.

The subject of the present article was a thirteen-year-old army horse, which had always enjoyed excellent health. He was admitted to hospital because, contrary to his habit, he had refused part of his ration, and had exhibited slight symptoms of colic. These symptoms increased in intensity. Borborygmi could easily be heard, and showed that there was no interruption of the intestinal movements. The case became rapidly worse. The pulse was scarcely perceptible and the respirations were hurried and short. It appeared as though expiration was effected without the aid of the abdominal muscles. An acute peritonitis was diagnosed.

Post-mortem examination revealed a rupture, about 20 cm. long, in the middle part of the greater curvature of the stomach. At the cardia and the pylorus and along the lesser curvature, the wall of the stomach was greatly thickened. Microscopic examination of the growth showed that it was composed of unstriped muscular tissue.

A CASE OF PERFORATING INTESTINAL ULCER WITH COMPLICATIONS IN A HORSE (*Ein Fall von perforierendem Darmgeschwür mit eigenartiger Komplikation bei einem Pferd*). R. SCHNEIDER. *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 6. June 1917. Pp. 335-340. 2 Figures.

In domestic animals intestinal ulceration is not a common lesion, though it occurs, for example, in swine fever and tuberclosis.

Without the manifestation of any symptom whatever of internal disease an eleven-year-old Irish mare was found dead in her box. On post-mortem examination the peritoneal cavity was found to contain several litres of a clear exudate, of a yellowish-green colour, mixed with scanty flakes of fibrin. The peritoneum was rough, dull, and somewhat strongly injected.

About four metres from the junction of the small and large intestine the mesentery of the ileum contained a rounded swelling filled with ingesta. On opening the ileum a perforating ulcer was discovered, through which, evidently, the ingesta had found its way between the two layers of the mesentery, and had thus been excluded from the peritoneal cavity.

The cause of the ulceration could not be determined; nor was there any indication as to its duration.

LARYNGEAL STENOSIS IN THE HORSE (Über Ursachen von Kehlkopfstenosen des Pferdes). O. BÜRGI. *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 7. July 1917. Pp. 377-393. 3 Figures.

Professor Bürgi gives particulars of four instances of "roaring," in none of which was the cause of the symptom an affection of either the recurrent nerve or the muscles of the larynx.

The first case was one in which the subject had suffered from angina and pneumonia accompanied by so much oedema of the larynx that tracheotomy had been necessary. "Roaring" was so marked during feeding that it could be heard at some distance. On post-mortem examination it was found that the deformity of the larynx was on the right side, and not on the left, as might have been expected. A considerable thickening extended from the middle of the right half of the cricoid lamina to the middle of the lateral face of the right arytenoid cartilage. Between the cricoid cartilage and the overlying muscle was a plate of bone about 0.5 cm. thick, and a small centre of ossification was present in the right dorsal crico-arytenoid muscle. The case was therefore one in which there was a combination of perichondritis ossificans with chondritis and a myositis ossificans. The right crico-arytenoid joint was ankylosed.

The second case was one with symptoms of purpura. The mucous membrane over the inner face of the arytenoid and of the ventricle was papillomatous, and there was induration of the mucosa and submucosa of the vocal fold, with small defects of the epithelium.

The third animal had been a "roarer" for some time. On post-mortem examination a cystic tumour was found in connection with the epiglottis.

In the fourth case there was a spindle-shaped varix in the region of the cricoid lamina which had pushed the right arytenoid cartilage towards the interior of the larynx.

DIETETICS.

THE COMPOSITION AND CLASSIFICATION OF WHEAT OFFALS. T. B. WOOD and R. H. ADIE. *Journ. Board Agric.* Vol. XXIII., No. 12. March 1917. Pp. 1179-1187.

As the authors say, "confusion has repeatedly been caused in attempting to assign an average composition to wheat offals described by local names." The confusion is due to different milling practices, with consequent variation in the composition of the offals produced. The authors made a systematic examination of a number of samples of wheat offals with a view to clearing up the confusion. It was found that the samples differed from one another in size of particles and in composition. In mills where the separation of the offals is most complete they fall into four grades—fine middlings, coarse middlings, pollards, and bran. In mills where the offals are not so completely divided the separation is not so distinct. Excluding the extremes—flour and bran—the offals may be classified into three "pure grades" and three "mixed grades." Chemical examination shows that there is practically no overlapping in the composition of the three pure grades.

The characteristic of fine middlings is a very high content of carbohydrates; coarse middlings contains less carbohydrates and more fibre, and pollards still more fibre. While the percentage of carbohydrates decreases and the percentage of fibre and ash increases as the size of particles increases, the same does not hold true for protein and fat. These constituents are highest in the coarse middlings and decrease as the particles become either larger or smaller. It is assumed that the germ is concentrated in the coarse middlings, which would account for this grade being richest in protein and fat.

The digestible nutrients and relative feeding values, in terms of maintenance and production starch equivalent, are given.

It is suggested that millers should adopt a uniform system of grading and naming wheat offals.
(R. G. L.)

THE RELATIVE INFLUENCE OF MICRO-ORGANISMS AND PLANT ENZYMES ON THE FERMENTATION OF CORN SILAGE. A. R. LAMB. *Journ. Agric. Res.* Vol. VIII., No. 10. 6th March 1917. Pp. 361-380. 13 Figures.

The question of the respective causal relationship of micro-organisms and plant enzymes to the fermentation of corn silage has long been in controversy. It is difficult to differentiate between the activities of these two kinds of agents. The author illustrates the results of his experiments with graphs and shows that bacteria are mainly responsible for acid production and the concomitant disappearance of sugars.

Alcohol is formed first by plant enzymes, and later by micro-organisms. Carbon dioxide evolution seems to be very largely due to respiratory or enzymic activities, but yeast probably has a share in its production after the first day or two. Micro-organisms are probably largely responsible for the heating of the silage. Both kinds of factors are always present during silage fermentation and the process is due to the activities of both in the absence of air.

(R. G. L.)

EXPERIMENTS ON THE USE OF PALM-KERNEL-NUT CAKE AS A FOOD FOR DAIRY Cows. A. LAUDER and T. W. FAGAN. Edinburgh and East of Scotland College of Agriculture. 1916.

Two experiments were carried out on dairy cows, one during the winter 1915-16, and the other during the summer 1916 with cows at grass. In each instance 4 lbs. of palm-kernel-nut cake were tested against 4 lbs. of Bombay cotton cake. The two rations in other respects were identical. Locust bean meal was included in each ration to make the palm-kernel cake more palatable; even then the cows did not appear to eat it as readily as they did the cotton cake. In both experiments the yield from the cows getting the palm-kernel cake fell off rather more quickly than from those getting the cotton cake. The cost of the food per gallon of milk produced was—for the winter: cotton cake, 7·41 pence; palm-kernel cake, 7·34 pence; for the summer: cotton cake, 4·64 pence; palm-kernel cake, 4·80 pence.

In the winter experiment there was not much difference in the cost of production, but in the summer experiment the cost of the palm-kernel cake was increased, and therefore the cotton cake was the cheaper food.

(R. G. L.)

EXPERIMENTAL RESEARCH ON THE DIETETIC VALUE OF MAIZE—RAW, STERILISED, AND DECORTICATED. E. WEILL and G. MOURIQUAND. *C. R. Soc. Biol.* Vol. LXXX., No. 8. 21st April 1917. Pp. 372-375.

These authors have previously called attention to the symptoms produced in animals (notably pigeons) by an exclusive or varied diet of grains completely sterilised or decorticated. (See this *Review*, 1917, Vol. I. p. 26.) From experiments on similar lines with maize they conclude that raw maize undecorticated has a high food value—it caused great vigour and exultation in their experimental pigeons. It is shown that sterilisation destroys the "ferment substances," and that paralysis due to a nutritional deficiency can be caused by sterilisation as well as by decortication, and also that decorticated maize has a dystrophic action (in certain cases) on cutaneous nutrition (pellagra?).

(R. G. L.)

THE DIETETIC VALUE OF WHEAT BRAN. R. G. LINTON and W. S. PETRIE.
Vet. Journ. Vol. LXXIII., No. 6. June 1917. Pp. 185-199.
4 Figures.

Opinions as to the nutritive value of wheat bran are not unanimous. Agriculturists, as a whole, agree that Kellner's valuation of this by-product is a correct one, or, at any rate, sufficiently correct for practical feeding. On the other hand, many veterinary practitioners are most emphatic in their assertion that bran has little or no nutritive property. Statements to this effect in veterinary publications have undoubtedly led to false conceptions among the profession. A brief description of the relationship of bran to flour, and of what the former really is, is followed by a résumé of feeding trials with this commodity. A hitherto unpublished record of a trial of bran with twenty horses, extending over a period of fifteen months, is given in detail; from it and from the previous records it is considered that Kellner's valuation of bran for cattle is equally applicable to the working horse. It is therefore assumed that 1·36 lb. of bran is equivalent to 1 lb. of oats.

Owing to the difficulty of digestion the vitamine layer has been found unchanged in human faeces. Feeding bran to five horses and slaughtering them at definite times it was found that the vitamine layer was to a large extent digested in the small intestine, but some particles only partially digested were recovered from the caecum and exceptionally from the first part of the colon. It is believed by some practitioners that feeding bran in large quantity to horses causes the formation of intestinal calculi. This is not considered to be true, and it is suggested that the primary cause of the deposition of the salts of bran is the presence of a nucleus provided by dirty food. An instance is given showing that exceptionally heavy feeding of this by-product to horses need not be productive of calculus formation. The unbalanced mineral content of bran is supposed to lead to calcium deficiency. While there is no evidence that serious results have been manifest in this country, it is, nevertheless, advisable to heed the caution given by others, that a calcium-deficient food should be supplemented with one rich in this salt, especially to milch cows and growing stock.

(Authors.)

A STUDY OF METHODS OF ESTIMATION OF METABOLIC NITROGEN. E. B. FORBES, C. E. MANGLES, and L. E. MORGAN. *Journ. Agric. Res.* Vol. IX., No. 12. 18th June 1917. Pp. 405-411. 3 Tables.

"The so-called metabolic nitrogen of the faeces is that portion which has an origin other than as an undigested food residue. It consists of residues from the bile and digestive juices, of epithelium and mucus

from the digestive tract, and of such products of bacterial activity as have been derived from digested and from digestible nitrogen." As the metabolic nitrogen is a factor which must be taken into consideration in the determination of the digestibility of protein, the authors endeavoured to estimate its amount. The plan followed was to feed a basal ration of maize to each of five pigs, and during subsequent periods additional nitrogenous supplements. Milk, blood albumen, and commercial dried egg albumen were used, as it was considered that the protein of these would probably be entirely digestible. An effort was made to determine which method of estimation of metabolic nitrogen would assign to any presumably completely digestible protein a digestion coefficient nearest to 100 per cent. It is admitted that an experimental study involving so much assumption cannot yield results of the highest value, but the authors hoped "to assist in the establishment of a useful conventional procedure." The methods under comparison were the acid-pepsin method; the acid-pepsin and alkaline-pancreatin method; and the alcohol, ether, hot-water and cold-lime-water method of Jordan. The apparent digestibility of the protein of maize, based on the total nitrogen of the faeces, is about 75 per cent.; owing to the presence of metabolic nitrogen the real digestibility is higher. The acid-pepsin method shows it to be 92 per cent.; the pepsin-pancreatin method 96 per cent.; and Jordan's method 86 per cent. The acid-pepsin method indicates that 70 per cent., the pepsin-pancreatin method 84 per cent., and the Jordan method 46 per cent., of the nitrogen of the faeces from maize is of metabolic origin. The digestibility of the protein of the supplements, as shown by the three methods of estimation, is given. The assumption that the nitrogen of the faeces is entirely an indigestible food residue is wrong. By the methods used in this study, so far as swine are concerned, the digestibility of protein is 20 per cent. higher than is usually assumed. It is considered that the acid-pepsin and the pepsin-pancreatin methods give truer results than does Jordan's method. The authors conclude that "we have no accurate scientific basis for the determination of the digestibility of protein." (R. G. L.)

A STUDY OF THE RATE OF PASSAGE OF FOOD RESIDUES THROUGH THE STEER, AND ITS INFLUENCE ON DIGESTION COEFFICIENTS. P. V. EWING and F. H. SMITH. *Journ. Agric. Res.* Vol. X., No. 2. 9th July 1917. Pp. 55-63. 5 Tables.

Investigations had previously shown that the digestibility of the crude fibre of some foods was apparently lowered when these were fed in a ration containing certain other foods. It was also indicated that these influencing foods increased the rate of passage of foods through

the steer. From these experiments the suggestion arose that there might be a correlation between the time required for the passage of the food through the animal and the moisture content of the faeces. Studies have therefore been made on the relationship between the moisture content of the faeces and the digestion coefficients; on the time required for the passage of food residues through steers (by the introduction of rubber discs into the food) and studies on the rate of food passage by calculations based on the intake of food and outgo of faeces and the alimentary tract contents as ascertained on slaughtering. It was found that, in general, a more complete digestion is associated with a more rapid passage of food residue through the steer. Crude-fibre digestion seems to be decreased with a more rapid passage of residues. Coarse foods retard the rate of passage of residues and finer particles of food, and finer ground foods pass through the animal more rapidly than coarse ones. An increase in the quantity of food consumed causes an increase in the rate of passage of residues. The use of rubber discs or colour indicators for the determination of the rate of food passage is not feasible. The addition of calcium carbonate or magnesium sulphate had no appreciable influence on digestive coefficients. The average specific time required for the passage of food residues probably varies between seventy-two and eighty-four hours. The experiments show that the rate of passage of residues is influenced largely by the nature of the ration and by the quantity, chiefly the former. The greater the capacity of the alimentary tract of the animal the longer the time required for the passage of residues.

(R. G. L.)

PHYSIOLOGICAL EFFECT ON GROWTH AND REPRODUCTION OF RATIONS
BALANCED FROM RESTRICTED SOURCES. E. B. HART, E. V.
McCOLLUM, H. STEENBOCK, and G. C. HUMPHREY. *Journ. Agric.
Res.* Vol. X., No. 4. 23rd July 1917. Pp. 175-198. 9 Tables,
16 Plates (76 Figures).

These investigators have previously shown that a complete ration must contain, in addition to an adequate amount and quality of protein and energy, a proper quantity and proportion of ash material and two factors of unknown constitution—"fat-soluble A" and "water-soluble B." Furthermore, the value of natural food-stuffs may be influenced by the factor of toxicity. Toxicity may be absent, or so mild as to be obscured when the other essentials of a ration are at an optimum adjustment, or its effects may only be revealed when the ration has been continued over a very long time and the animal involved in the extra strain of reproduction and milk secretion. Resistance to toxicity is greatly increased through a proper adjustment of the normal factors of nutrition. Recent developments have shown the need for further

studies of the contributing nutritive factors of single food-stuffs, and mathematical feeding-standards will rest upon a surer foundation and be more valuable as knowledge of contributing factors increases. An all-wheat-plant ration (wheat grain, wheat gluten, and wheat straw) in former experiments had given fair growth, but was a failure in reproduction with shorthorn heifers. Extensive and very careful feeding experiments were now conducted in order to locate the trouble in the all-wheat-plant ration. Restriction to the wheat plant did not sustain growth with Holstein heifers, and the animals failed to show *estrus* and did not breed. Pathological conditions resulted, such as blindness, feeble and emaciated condition, and abnormal excitability followed by collapse. The responsibility for such a condition is fixed upon two factors in the ration—poor salt mixture and inherent toxicity in the grain. Improvement of the ration could not be made by additions of salt alone. The substitution of corn stover (dried stalks of maize from which the ears have been removed) for the wheat straw caused sustained growth, but reproduction was only partially successful. By the use of alfalfa hay (Lucerne) for one-half of the wheat straw, results similar to those with corn stover were secured.

"The alfalfa and corn stover introduced a better salt mixture, a little different protein mixture, and probably a more plentiful supply of growth-promoting substances, all of which, according to our hypothesis, would either individually or collectively improve the ration, but not necessarily make it perfect."

With the all-wheat-grain rations there were marked histological changes in the nervous tissue of the offspring. Growing heifers showed symptoms of nerve degeneration, evidenced by blindness and great excitability. The causes of the disturbances were due to the inherent toxicity of the wheat grain and not to "deficiencies of vitamines." Maize grain, with wheat straw allowed, sustained but slow growth. The offspring were weak or dead. Additions to this ration of salt made it normal.

A physiologically complete ration, such as the corn-grain and corn-stover mixture, could not be disturbed, at least in a single gestation, by altering the calcium-magnesium ratio through the addition of magnesium salts. Even mineral acids, in sufficient quantity to make the urine acid, did not disturb its nutritive completeness. The addition of wheat embryo did cause disturbances, bringing about early abortions. This was due to its high content of the toxic material of the wheat kernel.

The authors draw the attention of veterinarians to the fact that the mothers fed on the wheat-grain ration possessed a low resistance to other diseases. In an outbreak of anthrax in the University herd the only losses to occur from this disease in the experimental herd were among the wheat-grain-fed animals.

(R. G. L.)

THE VALUE OF CIDER-APPLES AND POMACE AS FOOD FOR FARM STOCK.
 B. T. B. BARKER and B. N. WALE. *Journ. Board Agric.*
 Vol. XXIV., No. 5. August 1917. Pp. 530-537. 6 Tables.

In view of the necessity for utilising every possible source of food for stock, an experiment was conducted to determine the feeding value, if any, of cider-apples and freshly prepared pomace. From 60,000 to 70,000 tons of pomace are produced annually in this country. Pomace is fed to animals in the West of England, but there have been no feeding trials from which the nutritive value could be deduced. Chemical analyses have shown that fresh pomace has a higher feeding value than mangolds, and is richer in carbohydrates, but poorer in protein, than wet brewers' grains. Of the food value of cider-apples still less is known; but they have been fed in limited amounts when there has been a glut of the fruit. The authors in 1916 tested the feeding value of apples and pomace by substituting these for a portion of a definite ration to certain pens of pigs. The pigs had no difficulty in eating the apples, which were passed through a turnip-cutter to prevent choking. Pomace was also eaten readily, with the exception of one pen, but these took to it eventually. Judging from the returns, pomace is a useful article of diet for pigs fed at the rate of 2-3 lbs. per head daily. If carefully consolidated when it is made, pomace can be utilised, even if it is one and a half to two months old. This experiment suggests that the fruit can be used to best advantage if first pressed for cider, and then using the pomace for stock-feeding. Further tests are necessary, but this experiment appears to indicate that, "while for fattening pigs weighing not more than 55 to 60 lbs. per head neither cider-apples nor pomace give as satisfactory results as meal alone, both these foods possess a distinct feeding value for older pigs and store pigs."

(R. G. L.)

GENERAL.

THE ARMY VETERINARY SERVICE. 1914-1916. J. W. RAINY. *Journ. Roy. United Serv. Inst.* Vol. LXII., No. 446. May 1917. Pp. 232-259.

CONCERNING THE D.C.M. AND CAVALRY IN GENERAL (Dispositions diverses concernant les D.C.M. et la cavalerie en général).
 L. LÉPINAY. *Rev. Path. Comp.* Vol. XVII., No. 133. April 1917. Pp. (35) 99-(46) 110.

Major Rainey's aim is "to give a general idea of the objective and routine of the Army Veterinary Service" as now organised, the present

war being the first occasion in military history in which a veterinary service has had adequate financial backing. The British A.V.C. has justified its cost both on economic and humanitarian grounds.

"It is not possible at this stage to draw up a balance-sheet that would accurately, or even approximately, show what dividend the nation derives from its capital outlay in this respect, but the following figures present, it is thought, a fair *prima facie* case in favour of an Army Veterinary Service as an economic factor in war:—

"(a) The total wastage (including deaths, destructions, missing, and castings) among horses and mules of the British forces at home and expeditionary forces abroad, including losses from enemy gunfire and all other causes whatsoever, during the year ending 31st December 1916, amounted to 13 per cent. of the total animal strength.

"(b) The total wastage among horses and mules of the British forces during the year 1912 (*i.e.* during peace) amounted approximately to 14·80 per cent. of the total animal strength."

The average annual mortality in the South African War, 1889-1902, when there was no A.V.C., exceeded 55 per cent.

In the German South-West African campaign, 1914-1916, the mortality was 9·09 per cent. The conditions of these two African campaigns differed only in that the latter had the services of an A.V.C.

The present A.V.C. consists of over 1200 officers and considerably more than 20,000 N.C.O.'s and men. In 1914 there were only 109 officers and 321 of other ranks.

The work of the Army Veterinary Service comprises:

1. Examination for soundness prior to purchase.
2. Care of remounts on board ship.
3. Prevention and control of contagious and other diseases.
4. Treatment of minor cases of sickness and injury.
5. Evacuation to veterinary hospitals of all cases of sickness or injury that cannot be treated properly with the unit.
6. Maintenance of an efficient standard of horse-shoeing.
7. Supply of veterinary medicines and equipment.
8. The training in schools of farriery of shoeing-smiths and cold-shoers.
9. Careful observance of and advice upon all matters directly or indirectly affecting the welfare of the army horse; *e.g.* stable management, forage and feeding, watering, etc.

Prevention is of the highest importance. Every horse is inspected at least once daily, and since practically every horse suffers an attack of influenza prior to commencing his military training, the enormous amount of detailed work and organisation involved in detection and treatment is obvious.

Transports.—A veterinary surgeon accompanies all horse and mule transports, and even on the roughest voyages the loss rarely amounts to 1 per cent. A very interesting diary of a conducting officer of a fourteen-days' voyage is given, from the inspection of the 978 horses before embarkation to the landing of the same without a single loss. During the voyage, through intense heat, storm, and other exigencies of the weather, constant vigilance is maintained, every horse being visited at least twice a day. Animals are now carried free in pens of five, in place of the former single stalls. This gives freedom of movement, better facilities for sanitation and ventilation, and is economical of timber.

At the Front.—The A.V.C. works with divisions in the front line and in field units. Each division has its proper number of officers, N.C.O.'s, and men. Simple first-aid treatment is given, and, where necessary, cases are handed on to the mobile veterinary section for evacuation to veterinary hospitals on the lines of communication. Field dressing for open wounds is done as follows:—Foreign bodies are removed, shreds of damaged tissue cut away, the wound is cleansed with antiseptic wool, facilities for downward drainage are established, and all exposed tissue then painted with tincture of iodine.

The mobile veterinary section is a complete veterinary unit allotted to a division, and its duty is to collect all animals requiring hospital treatment, to act as dressing-station and distributor of veterinary medicines and equipment to the divisional combatant units. Half of the staff attends to first aid, and half to conveying cases to the base veterinary hospital.

There are veterinary hospitals at the base and on lines of communication. Each hospital accommodates 1250 patients, having separate wards for different classes of injury or disease, and the necessary stables, operating-sheds, shoeing-forges, exercising-tracks, storehouses, etc. One hospital has been set apart for mange cases alone. Dipping-baths take the place of the former laborious hand treatment, and mange has been kept well under control. Indeed, 80 per cent. of all cases of disease are returned to duty in due course.

A tribute is paid to the valuable help afforded by the R.S.P.C.A. in building and equipping these hospitals, providing horse-tents, ambulances, etc., for which over £100,000 has been collected. The fund also provided accommodation for 9500 horses in convalescent horse depôts, and supplied Vermoral sprayers and motor-lorries. The ambulances are especially useful for the very frequent cases of picked-up nail, numbering hundreds a week.

The schools of farriery for the training of cold-shoers and shoeing-smiths are described. 1000 cold-shoers are turned out every month.

each man getting two busy months' instruction, while five months are required to make a shoeing-smith.

The article closes with an appeal for State aid for veterinary education.

M. Lépinay welcomes the recent creation of field veterinary hospitals in France, and looks forward to further improvements on the lines of the British A.V.S. He believes that the best work of the veterinary surgeon is done at hospitals at the base, and not amid all the turmoil of the front. The D.C.M. (dépôts for sick horses) have been proved to be a nuisance at the front. They soon became swamped with cases; they complicated the transport of rations, and monopolised barracks and camps that might have been put to better use.

M. Lépinay suggests the establishment of (a) stations at the front for the immediate destruction of hopeless cases, and classification of the rest, sending on those which can travel to (b) the ambulance station, six or eight miles in the rear. Here a further sorting, the worst cases being retained and the rest going to (c) the base veterinary hospital.

Mobile veterinary hospitals should also be provided. These would be far more economical than the D.C.M.

(F. B.)

HYGIENE AND PREVENTIVE MEDICINE.

CONTROL OF THE CONDITIONS OF MANUFACTURE AND SALE OF TINNED MEATS (Contrôle des conditions de fabrication et de mise en vente des conserves de viandes). G. BARRIER. *Rec. Méd. Vét.* Vol. XCIII., No. 5. 15th March 1917. Pp. 139-145.

A report by Barrier, with a resolution passed by the Committee of Public Hygiene of the Department of the Seine, 22nd December 1916. A commission, appointed to investigate the conditions under which tinned foods were prepared and sold, found that in many cases old scraps and waste bits of meat, carelessly treated and improperly sterilised, were being used by certain unscrupulous manufacturers, and that many cases of poisoning had resulted. These conserves evaded the law requiring the nature of the meat to be distinctly shown on the label, and sometimes one single mixture would be packed into boxes and labelled with thirty different names! The Committee's resolution is as follows:—

That in view of the danger which may result from the bad quality and the defective preservation of their products, all food-preserving factories should be subject to strict supervision.

That all covers and receptacles containing preserved foods should bear a label clearly stating the usual name of the component parts of the preparation, and the proportion of each part per 100 grammes, spices and aromatics excepted.

(F. B.)

MEAT INSPECTION, WITH SPECIAL REFERENCE TO THE DEVELOPMENTS OF RECENT YEARS. W. J. HOWARTH. *Lancet*. Vol. CXCIII., No. 4901. 4th August 1917. Pp. 147-153. *Ibid.* No. 4903, 18th August 1917. Pp. 225-231. *Ibid.* No. 4905. 1st September 1917. Pp. 335-341. 15 Tables.

The Milroy Lectures for 1917, delivered before the Royal College of Physicians of London, were devoted to the consideration of the present position of meat inspection, more especially in respect to tuberculosis. The subject of meat inspection will, the lecturer believed, receive more attention after the war than has been the case in recent years. Many striking anomalies and defects of an administrative character which call for reform and improvement exist, and to these official notice was being directed before the great upheaval temporarily relegated them to a position of comparative obscurity. With a view to ensuring uniformity of action, *routine* meat inspection should be made a compulsory duty of all urban sanitary authorities, and there should be compulsory inspection of those slaughter-houses in rural districts at which carcasses are dressed for sale in outside areas. Inspectors engaged on meat inspection should be required to possess proof of knowledge of the subject.

Regulations should be framed dealing not only with the details of inspection of carcasses, but with the sanitary requirements of slaughter-houses, facilities for inspection, and perhaps the requirements of ante-mortem examinations. A system of meat marking under the direct control of the Local Government Board should be instituted. In districts where there is a system of meat marking in operation, the local authority should have power to require that all meat used in prepared meat products should be inspected and approved before being used.

The Government should appoint inspectors to visit the chief places abroad where the work of boning, canning, and exporting meat generally is carried on.

Regulations should be framed to control cold stores in which food products of any kind are stored.

Regulations should be framed to ensure that meat is handled in a cleanly manner.

INFECTIOUS DISEASES.

A REPORT UPON AN OUTBREAK OF STOMATITIS CONTAGIOSA. H. E. GIBBS. *Vet. Journ.* Vol. LXXIII., No. 5. May 1917. Pp. 147-155. 4 Figures.

CONTAGIOUS STOMATITIS IN HORSES. A. C. BURTON. *Vet. Journ.* Vol. LXXIII., No. 7. July 1917. Pp. 234-242. 4 Figures.

Major Gibbs publishes notes on the occurrence of an outbreak of contagious stomatitis in horses.

The period of incubation was less than twenty-four hours when the contents of the unbroken vesicles were used. In experiments carried out under conditions giving, as near as possible, the natural mode of infection the period of incubation ranged from five to nineteen days. The temperature may rise to 103° F. within twenty-four hours of the appearance of the vesicles, but does not remain at this for longer than forty-eight hours.

Saliva isropy and profuse, and may become frothy. The commonest site of the lesions is the dorsum of the tongue, but the lips, palate, and cheeks may be affected in this order of frequency. The vesicle, which contains a straw-coloured serous fluid, ruptures and leaves a raw^{*} surface to which, in a few hours, a straw-coloured jelly adheres.

The disease takes from four to six weeks to run its course. Healing takes place from the periphery of the lesion. The general treatment consists in isolation, disinfection, and the giving of soft food. The most satisfactory local treatment has been the application of zinc chloride to the lesions.

According to Captain Burton, horses readily contract the disease, mules less readily. The author, his staff-sergeant, and a corporal dresser all contracted the disease. There seems to be evidence that the virus becomes inactive after forty-eight hours. If immunity is conferred by an attack, it is of short duration. The disease is malignant, and under certain circumstances may be serious or fatal. The "condition" of the animal appears to have an influence on the progress of the disease.

The most severe lesions are those of the tongue, which are nearly always secondary to lesions of the lips, gums, palate, or cheek. Salivation is variable and recurrent, and, speaking generally, may be said to be present only when the tongue is affected. Colic is a frequent symptom, especially in bad cases where there is gastro-enteritis. The mouth and lips are apparently sensitive out of proportion to the lesions present. The lesions of the foot may be described as an eczematous coronitis. Vesicles appear rapidly and rupture, allowing the escape of

a straw-coloured exudate. The horn is separated from the skin, sometimes to a considerable depth.

Captain Burton has obtained very satisfactory results from irrigation of the mouth—three, four, or more times a day—with a solution of half an ounce of permanganate of potassium in 5 gallons of cold water.

EPIZOOTIC LYMPHANGITIS (Sur la lymphangite épizootique). CHARMAY.

Rec. Méd. Vét. Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 179-196. 5 Figures. (Sur la culture du parasite de la lymphangite épizootique.) A. BOQUET and L. NÈGRE. *Bull. Soc. Path. Exot.* Vol. X., No. 4. April 1917. Pp. 274-276. (Notes sur la détermination de la période d'incubation de la lymphangite épizootique en France.) PERRIN. *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 3rd May 1917. Pp. 191-194. (Le traitement curatif de la lymphangite épizootique par la vaccinothérapie.) VELU. *Ibid.* Pp. 195-204. (Un traitement de la lymphangite épizootique.) BRINGARD. *Rec. Méd. Vét.* Vol. XCII., No. 12. 30th June 1917. *Bull. Soc. Centr. Méd. Vét.* 7th June 1917. Pp. 216-222. (L'arsenivan nella cura del farcino criptococcico.) F. FAVERO. *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI., No. 6. 30th June 1917. Pp. 129-136.

The article by Charmoy deals with the disease in a very comprehensive manner. The author recalls that, though epizootic lymphangitis was common in certain of the French colonies (Algiers, Morocco, Senegal), it was little known in France before the war. It made its appearance among army horses towards the end of 1914, and has since become so prevalent and widespread as to be a veritable menace.

The cryptococcus of Rivolta may be conveyed by flies, soil, harness, attendants, etc., and infection is favoured by any break in the skin. Most commonly the disease spreads from a fissure, harness-gall, or war wound. It is necessary to remember that the cryptococcus *does not necessarily interfere with the healing of a wound*, and that abscesses may form a long time after healing has taken place. Abscesses and ulcers may develop without cording of the lymphatic vessels.

On the lips, nose, and chin the author has noticed lesions with characteristics notably different from those described as belonging to the classic forms. These regions may be invaded by a multitude of round or oval ulcers, varying in diameter from that of a lentil to 20 cm. Their margins, slightly raised above the general skin level, are surrounded by a whitish zone, and the bottom of the ulcers are formed by small granulations of a dark red colour.

Attention is called to the possibility of lesions of the nasal mucous membrane, as most recently described by Bridré (*Bull. Soc. Centr. Méd. Vét.*, November 1916) and Cazalbou and Morel (*Rev. Path. Comp.*, November 1916 [see this *Review*, 1917, Vol. I. p. 131]).

Another atypical form of lesion is the appearance around the original wound of a crop of abscesses and ulcers in which granulations are so exuberant as to attain sometimes a thickness of 2 cm. This manifestation indicates great virulence and renders the prognosis gloomy.

The question of whether the disease is a purely local one affecting the skin only, or whether it may affect the body generally, does not appear to have been settled. Charmoy has not been able to convince himself that there is more than a cutaneous affection, or that the health of the individual is sensibly altered. Nor has he had evidence of suppurative peri-osteitis, osteomyelitis, or hypertrophic osteitis such as have been described by Monod and Velu (*Rec. Méd. Vét.*, 15th October 1915).

In respect of differential diagnosis Charmoy thinks it is prudent to apply the mallein test to all animals with ulcers.

Prognosis depends upon the localisation of the lesions. When the head, neck, or trunk is affected, cure is easy under treatment. When the lesions are on the shoulders, arm, forearm, croup, thigh, or leg, cure is slower in being effected, but may be attained in the majority of cases. When the lesions are located towards the extremity of the limbs (and particularly the posterior), they yield to treatment slowly and may resist altogether.

The number and diversity of modes of treatment which have been advocated shows that, as yet, there is no real specific. The ideal local treatment is total extirpation of all the lesions; but this is obviously impossible unless they are very circumscribed. Failing extirpation, cauterisation, or the application of chemical agents, or a combination of both, is suggested. Charmoy has made cauterisation the basis of his line of treatment, and gives a table of forty-eight cases, of which twenty-nine have been cured in a time varying from twenty days to three months.

Boquet and Nègre have already stated that they have observed a mycelial form of the cryptococcus of Rivolta. The medium they now suggest consists of a filtered decoction of 400 grammes of dried horse-dung to 2 litres of water, to which 1 per cent. peptone, 1·8 per cent. agar, and 4 per cent. glucose are added. The cryptococci from pus taken from an unopened abscess are said to develop filaments after forty-eight hours' incubation at 24° to 26° C. The growth of the mycelium stopped after fifteen to twenty days, and subcultures could

not be obtained. The authors concluded that failure in subculture might be due to the absence of pus. They therefore smeared the surface of the horse-dung agar with a sterile maceration of lymph-gland of the horse. After six weeks small colonies were recognisable. These consisted of a mycelium from which double-walled cells were ultimately liberated.

In a group of artillery horses Perrin has observed the period of incubation of epizootic lymphangitis in five animals. In these five cases the periods of incubation, with the possible errors in excess, were as follows:—(1) 127 days, possible error of 15 days; (2) 111 days, possible error of 24 days; (3) 115 days, possible error of 15 days; (4) 120 days, possible error of 7 days; (5) 120 days, possible error of 15 days. The mean of these figures gives about 118 days as the average maximum period of incubation, with an average possible error of 15 days. That is to say, in the five cases on which observations were made it does not appear that the average period of incubation could have been less than 103 days.

Velu is of opinion that vaccine treatment of epizootic lymphangitis is capable of giving excellent results. The vaccine he prepares as follows:—Pus is withdrawn aseptically by means of a syringe and emulsified in ten times its volume of physiological serum to which 2·5 per 100 of phenol has been added. Then 150 grammes of ether is added for every 1100 grammes of the emulsion. Thus prepared, 2·5 c.c. of vaccine corresponds to 0·2 c.c. of pus. The mixture is filtered through four to six thicknesses of coarse-meshed gauze.

On subcutaneous injection there is first produced a negative phase in which all the symptoms are aggravated. This phase lasts three or four days (sometimes five or six), and varies in intensity with the dose of vaccine. The subsequent positive phase lasts on an average four or five days, but it may range from zero to ten days. After its termination the disease resumes its natural course. A fresh injection produces similar manifestations; but, if it is made before the end of the positive phase, the negative phase which follows is somewhat retarded and is less intense and of shorter duration than the negative phase which followed the first injection.

The problem of vaccino-therapy consists in finding the suitable dose of the vaccine and the intervals at which they should be renewed, in order to render the negative phases insignificant and the positive phases predominant.

The plan to be followed is to inject 2·5 c.c. of the vaccine and watch the case for seven or eight days. If the symptoms are aggravated the dose has been too large, and it is necessary to suspend treatment for several days and then give a smaller dose. If there is no modification

of the disease, the dose has been too small, and a larger one should be injected immediately. If there is clear amelioration of the symptoms, the dose has been sufficient and should be renewed without delay. It may be slightly increased or diminished (by about 0·25 c.c.) in accordance with the negative reaction obtained. If the negative phase is slight and short, increase the dose; if it is intense and prolonged, diminish the amount.

Cure should be possible in from thirty to forty days.

Bringard states that his observations permit him to assert that the cryptococcus is always introduced by way of a more or less extensive wound, and is conveyed thither by the harness, by grooming implements, by flies, or by contact with infected soil. He has concluded that the treatment which is called for consists in the surgical extirpation or destruction of the corded lymphatic by some procedure applied to the interior of the vessel. He has, therefore, devised an iron skewer, about the thickness of a pencil and 40 cm. in length, with which he cauterises the interior of the affected lymphatic vessels. The author claims that his method produces a radical cure in four or five weeks.

Favero has made observations on the effect of a compound (*arsenivan*) prepared by Dr. O. Bocchi of Parma, and gives the results of its use in ten cases of epizootic lymphangitis. He employed the drug in varying doses (25 c.c. to 50 c.c.), both intravenously and subcutaneously. In all the ten cases a cure was effected in from eleven to thirty days. In one instance "galyl" had been administered on 29th March and 5th, 12th, 19th, and 26th April without any advantage. On 2nd, 4th, 6th, and 8th May 50 c.c. of arsenivan was injected subcutaneously, and on the 20th May (*i.e.* in nineteen days) the animal was cured.

ABORTION IN DAIRY CATTLE. W. L. WILLIAMS. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 348-363. 3 Charts.

Readjusted in harmony with the researches of the past four years, Professor Williams' views regarding the source of infection and the avenue of invasion of abortion may be outlined as follows:—

The largest known volume of the infection accumulates in the gravid uterus, and is very largely expelled prior to, during, and soon after the termination of pregnancy. Less in volume than in the uterus, but more frequently recognisable by present methods, is the infection in the milk. The infection may and does pass through the chorion, penetrates the amniotic cavity, and is swallowed by the foetus. It may cause foetal diarrhoea, or may be lodged in the meconium ready to cause white scours or, later, pneumonia in the new-born calf. Most calves are born free from the infection. Infection-free new-born calves

generally or always ingest infection with their milk, either from the interior of the udder or from the exterior of the teat, which has been soiled by discharge from the genital tract. The infection is intensified, especially in dairies, by the use as calf food of unmarketable milk from badly diseased cows.

The cohabitation of evidently diseased with apparently healthy cows; intermediary bearers, such as attendants and visitors; and the contamination of the food of adult cattle play a minor rôle in the dissemination of the disease. The bull plays an important rôle. Definite experimental proof of this is wanting, and the clinical evidence is contradictory.

An abortion storm may be roused in a herd intrinsically through unfavourable conditions within the herd, or extrinsically through the introduction of new cattle of either sex from herds having a more highly virulent type of infection.

Instead of the isolation of aborters, Professor Williams has advocated for some years a plan of control based upon the conception outlined above. In brief, his plan is as follows:—

• Bathe and disinfect the cow before calving, and place her in a clean stall. Remove the calf immediately after birth. Cleanse and disinfect the udder and neighbouring parts before permitting the calf to suck or drawing milk for it. Keep the calf on the raw whole milk of the dam or of a selected cow for eight to ten days, and thereafter feed on sterilised milk, which may be skimmed, mixed, etc.

When metritis exists and causes sterility, abortion, premature birth, or retained afterbirth, cure the metritis—cure it promptly and well—or send the cow to the butcher.

Protect the bull by douching the external genitalia regularly before and after service.

Do not introduce into a herd, except when absolutely necessary, new animals of either sex which may bring into the herd a more virulent strain of infection than that already present.

CATTLE PLAGUE IN SAHEL (*Il gulhai nel Sahel*). A. ZONCHELLO. *La Clinica Vet.* Vol. XL, No. 5. 15th March 1917. Pp. 113-132.

An account is given of the introduction and course of cattle plague in the Sahel, and the writer contrasts the inefficiency of specific treatment with the good results obtained by a purely preventive treatment. While cattle plague was raging in all the Italian colony the Sahel was immune up to 1904, when it was introduced by a herd from Elabered. The disease spread rapidly amongst the bovines which

had no hereditary immunity, and out of herds of 100 heads only two or three survived. The population was very disheartened by such ravages, and most of it turned to breeding pigs and sheep. The "gulhai" was in the Sahel again in 1905, and has ever since been enzootic in that country. The mortality, however, which in the first year amounted to no less than 97 per cent., gradually went down to 50 per cent., and after ten years, in various herds observed by the writer, the percentage was nil, a fact which goes to prove that the virus may exhaust itself spontaneously.

After allowing the plague to rage for many years, the authorities came to the decision that something had to be done in order to check its ravages. Neglecting the elementary prophylactic dispositions, vast experiments were undertaken with the specific treatment, and the sero-vaccination or simultaneous method of Kohle and Turner was adopted on a large scale, after Thieler and the Bloemfontein conference had declared it inadequate and Koch had disapproved it for Egypt, where it provoked veritable disasters. In order to combat an infected centre of 100 heads, the treatment was applied to about 3000, in order to create around that centre a zone of immune subjects which would in theory choke the centre. In practice, however, the centre, which would probably have exhausted itself in time, was widened and made more virulent, while isolation became next to impossible. Thus, from a centre of 100 cattle, one was created of several thousands, which had the drawback of occupying a wider area, and hence a larger contact with surrounding cattle, and more especially the wild animals susceptible to the plague, which is one of the common means by which the infection is carried to other centres. No sero-vaccination treatment in the Sahel answered the purpose of stamping out the disease from an infected centre. In face of these facts, and the very doubtful results obtained by this method, the writer decided to discard it in the region under his control, and resorted to purely prophylactic and sanitary methods and the strict isolation of infected centres. The results obtained, even after the short period of one year, have been most encouraging, and the writer is of the opinion that had this method, coupled with a strict control of the Abyssinian boundary, been applied to the whole colony, "the gulhai" would by this time have been practically stamped out.

(T. M.)

THE DOG AS A CARRIER OF ANTHRAX (Il cane nella propagazione del carbonchio ematico). L. SANI. *La Clinica Vet.* Vol. XL, No. 11. 15th June 1917. Pp. 315-324.

In order to demonstrate the possibility of the dog acting as a disseminator of anthrax, three animals were fed on a mixture of

muscle, spleen, liver, heart, and kidneys of several guinea-pigs affected with anthrax. The material fed to the dogs was rich in spores and bacilli. All three animals remained perfectly healthy during the whole time of the experiment, although anthrax bacilli were to be found in the faeces for twenty-six, twenty-eight, and thirty-two days after ingestion of the infected material, and positive results were obtained on inoculation of guinea-pigs.

These observations show that dogs are capable of spreading the disease, it may be to a considerable distance, when fed upon material containing the anthrax organism.

RABIES IN PARIS AND THE DEPARTMENT OF THE SEINE (La rage à Paris et dans le département de la Seine). MARTEL. *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 19th April 1917. Pp. 157-176. 7 Figures.

There has been a serious recrudescence of rabies in Paris and the surrounding district. Between May 1916 and April 1917 seventy-two cases were reported, as against an average of four per annum for the preceding three years. Two persons were bitten in this area and died. The disease reappeared thrice in the same centre with intervals of twenty-nine and thirty days, thus indicating the existence of a particularly virulent form of rabies. Starting in the north of Paris the epizootic spread in August 1916 to the suburbs.

The Veterinary Sanitary Service gave the author access to sixty-two cases of animals impounded, and tests were carried out on thirty living dogs, and on twenty-eight dead dogs and four dead cats. Inoculations gave positive results in 76·57 per cent. of the first-named cases, and the very short period of incubation indicated a serious epizootic. It was often only twelve, thirteen, or fourteen days, but the greater number required fifteen to twenty days. Nerve centres were examined for the presence of Negri bodies, and these were found in 74 per cent. of the cases examined.

The cause of the outbreak is presumed to be the introduction of dogs into Paris by people from the provinces and by soldiers returning from the front; and also to the presence of many stray dogs. There has been a serious increase in the number of cases recorded in the provinces. In 1913-14 there were 1747 cases, but no fatal consequences to human beings. In 1916, 3282 cases were noted, and 1755 persons were bitten, of whom 11 died.

The large number of stray dogs is a constant menace. By the Act of 2nd September 1916 owners of dogs are required to keep them on a

leash or muzzled, but the law is evaded. The police have made serious efforts to rid the streets and roads of stray dogs, and from June 1916 from 800 to 2000 dogs have been impounded per month. The author urges that stricter enforcement of the law alone will save the recurrence of a worse epizootic this summer. The Central Veterinary Medical Society has passed resolutions urging that the police should redouble their efforts to capture unmuzzled dogs in order to stamp out the present outbreak and so reassure the public, and that all violations of the law should be prosecuted.

(F. B.)

THE ETIOLOGY OF HOG CHOLERA. F. PROESCHER and H. A. SEIL.
Journ. Amer. Vet. Assoc. Vol. LI., No. 1. April 1917.
Pp. 64-69. 5 Figures. SECOND REPORT. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 608-623.
3 Tables, 13 Figures.

The authors claim to have discovered a micrococcus in the blood and urine of pigs which they think is the causal agent of hog cholera.

Blood-smears were taken from six pigs in an advanced stage of hog cholera, and from twenty-eight pigs artificially infected. All the pigs were examined post mortem, and the characteristic lesions of hog cholera demonstrated.

"The air-dried blood-smears were fixed for half an hour, either in methyl alcohol or in a 5 per cent. aqueous solution of sodium tetravanadate, and the fresh smears of a 5 per cent. alcoholic ammonium uranicitrate solution at 60° C. for the same time. The smears from the last two fixations were thoroughly washed with distilled water and stained in a 1 per cent. aqueous solution of methylene azure containing 1 per cent. of phenol. The smears fixed in methyl alcohol were dried and stained as above. The cover slips were floated on the methylene-azure solution to prevent precipitation for about eighteen hours, then thoroughly washed with water, dried, and mounted in paraffin or cedar oils."

In addition to the usual cellular elements of blood the smears contained oval or irregular cells, isolated or in masses, which were recognised as endothelial cells exfoliated from the wall of the blood-vessels. The protoplasm of some of the endothelial cells contained two well-defined structures, namely, mitochondria and a diplococcus. The diplococci were very small, uniformly less than 0·1 μ , and stained either deep blue or a metachromatic violet. In shape they were either spheroid or ovaloid. In addition to those within the endothelial cells, they were also found between the red cells and attached to them, either

as diplococci or as short chains consisting of four to six cocci, or sometimes grouped in clusters.

The second report is concerned mainly with the blood changes, the staining properties of the virus, the microscopic changes in the organs, and the cultivation of the organism. The blood counts are not conclusive because of their incompleteness. A more detailed account of both the macroscopic and microscopic changes in organs is promised later. The most pronounced microscopic changes are found in the lymphatic system and spleen, where the inflammatory reaction is of a plasma cellular character. Thus far a third subculture of the organism has been obtained. For staining cultures, the Gram fuchsin method is more satisfactory than the methylene-azure carbonate method.

TREATMENT OF ULCERATIVE LYMPHANGITIS BY BACTERIO-THERAPY

(Traitement de la lymphangite ulcéruse par la bactériothérapie).

C. TRUCHE. *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 19th April 1917.

Pp. 155-180. (Traitement bactériothérapeutique de la lymphangite ulcéruse.) C. TRUCHE. *Ann. Inst. Pasteur.* Vol. XXXI, No. 5. May 1917. Pp. 209-214.

The writer's experience with bacterio-therapy in the treatment of ulcerative lymphangitis has been very satisfactory. He prepares the vaccin in the following manner:—A culture of the Preisz-Nocard bacillus is emulsified in physiological saline. The emulsion is centrifuged, decanted, again diluted with saline, centrifuged for the second time, and finally decanted. The deposit is then carefully emulsified in alcohol. More alcohol is added by degrees, and an equal volume of ether.

After twenty-four hours the alcohol-ether is decanted, and the deposit is dried at 37° C. in a Petri capsule. A powder is thus obtained which is easily preserved and divided into doses.

One centigramme of the powder, dissolved in physiological saline, is injected subcutaneously in the neck. The injection is repeated once or twice (according to the gravity of the case) at intervals of eight days.

Slight local swelling, which disappears on the following day, occurs at the point of injection. The temperature reaction is slight (0.5° to 1° C.). There is no general reaction.

MEDICINE.

PNEUMONIA: ITS PREVENTION AND TREATMENT AS OBSERVED AT THE BRITISH REMOUNT dépôt, NEWPORT NEWS, VA. J. GREGG, F. X. MAGUIRE, A. GILLESPIE, G. S. GLOVER, and H. W. LAUGHLIN. *Amer. Journ. Vet. Med.* Vol. XII., No. 8 August 1917. Pp. 505-511.

Pneumonia and pleuro-pneumonia being responsible for 96 per cent. of the usual death-rate at a remount dépôt, it was natural that the authors should devote much attention to the problem of preventive and curative treatment of pneumonia.

The preventive treatment now used at the Newport News Dépôt consists of the administration of serum from recovered pneumonia patients which have been hyperimmunised with large doses of the most virulent strains of streptococci which can be found in post-mortem examinations.

Various modes of curative treatment have been tried, and a tabular statement of the number of deaths under each treatment is given in the paper. Counter-irritation has been found beneficial only when applied in the very early stages of the disease. Drenches, it has been concluded, are far more harmful than beneficial. The best stimulant has been found to be strychnin sulphate administered hypodermically. Nuclein was of practically no value. Camphor and creosote in oil, given intratracheally, was valueless. Success did not attend the sub-cutaneous injection of pleural exudate from an animal suffering from pneumonia (Gilbert's treatment). Salvarsan and other arsenical preparations have given varying results.

The best results have been obtained from normal saline and soluble iodin infusion after bleeding. The method of procedure is as follows:—"The jugular vein is raised by compression with cord, and a small area is clipped and painted with iodin. The animal is bled, about 1 gallon of blood being removed by the use of a large calibre slip hypodermic needle, $1\frac{1}{2}$ in. long. Immediately after bleeding, and through the same needle, normal salt solution (1 quart), with soluble iodin (1 drachm) (soluble iodin with potassium iodide coefficient of one was used), is injected by use of Fowler's salt solution apparatus. The adapter fitting the slip of the needle makes only one puncture necessary for the bleeding and administration of medicine. Daily, or every two or three days, the injection is repeated according to results. Bleeding is also repeated in a few days if a full pulse is noticed. This treatment has been found beneficial even in cases where the pulse contra-indicated bleeding. The results in many cases were nothing short of wonderful."

METHODS.

THE TECHNIQUE OF THE PREPARATION OF CULTURE MEDIA CONTAINING ALBUMINOUS FLUIDS. P. FILDES. *Lancet*. Vol. CXCII., No. 4883. 21st March 1917. Pp. 492-493.

The great advantage obtained by the addition of albuminous fluids to culture media is acknowledged, but there is a difficulty in sterilising them without altering their physical or nutritive properties. Fildes has already called attention to sterilisation with ether reinforced by the application of slight heat. The method, however, has certain disadvantages. Sometimes a batch of serum has been found not to be sterilised, and the presence of refractory bacteria necessitates heating in the incubator for days or weeks.

The author now describes a method in which chloroform is used as the sterilising agent. A trial was made with 0·5 per cent. chloroform upon some contaminated serum. This was placed in a tightly-stoppered bottle and heated in a water-bath at 45° C. One hour at this temperature was found to sterilise the serum completely, without in any way altering its appearance.

Details are given of the routine sterilisation by this method of serum, ascitic fluid, and blood; and the method of preparing media with sterile albuminous fluids is briefly described.

PARASITOLOGY.

THE VIABILITY OF *MELOPHAGUS OVINUS* (LINN.), THE SHEEP LOUSE-FLY, SHEEP KED, OR SHEEP "TICK." GEORGINA SWEET and H. R. SEDDON. *Vet. Journ.* Vol. LXXIII., No. 4. April 1917. Australian Supplement. Pp. 6-14. 3 Tables.

This research is intended to throw some light on the conditions determining the life-history of the parasite. Some doubt exists respecting the time that *Melophagus ovinus* can live after removal from sheep, there being a general impression that the ticks die in or about four days.

The authors kept the parasites under a variety of conditions, and found that the period of viability varied considerably. The following summary indicates the time when the last of the parasites (without food) died under the different conditions:—

Bare soil on lawn	$2\frac{3}{4}$ days.
Dead leaves on soil on lawn	$2\frac{3}{4}$ "
Wool on laboratory bench	$3\frac{1}{4}$ "
Wool in cellar	4 "
Moist grass on lawn	$5\frac{1}{4}$ "
Moist grass in cellar	$6\frac{1}{4}$ "
Bare soil in cellar	11 "
Dead leaves on soil in cellar	$11\frac{1}{4}$ "

Though one set of experiments does not justify the drawing of extensive conclusions, it seems possible to say that a moderately cool, uniform temperature is the most favourable condition for the persistence of the tick off the sheep and without food, especially if it be dry. If extremes of temperature be present then moisture is necessary, dryness soon proving fatal. The life of ticks in shed wool is short under uniform temperature, whether cool or moderate. The state of nutrition does not seem to have influenced the viability of the ticks.

TRYPANOSOMIASIS IN HORSES IN MOROCCO (La trypanosomiase des chevaux au Maroc. Étude expérimentale). H. VELU. *Bull. Soc. Path. Exot.* Vol. X., No. 3. March 1917. Pp. 253-260.

The author has already published observations on this disease, and the name *Trypanosoma maroccanum* has been given to the causal agent. The present paper contains an account of inoculation experiments with the trypanosome-containing blood of six horses.

The white rat is very susceptible. An incubation period of three or four days was followed by an acute infection, which lasted from seven to ten days. There was great enlargement of the spleen.

In the rabbit the disease was chronic, with a long and irregular course. There were no symptoms or lesions which differ from those of other trypanosomiases in this animal.

The disease in the dog was subacute, with frequent febrile crises. Two mules developed the disease rapidly.

In two sheep and two goats the only symptoms were attacks of fever and wasting. Infection in the goat could only be demonstrated by inoculation of large quantities of blood into dogs. The goats recovered at the end of twelve and thirteen months.

DERMATITIS AND DEMODECTIC MANGE OF BOVINES (Dermatose et gale démodectique des bovidés). R. VAN SACEGHEM. *Bull. Soc. Path. Exot.* Vol. X., No. 2. February 1917. Pp. 117-120.

Tropical dermatitis of cattle, caused by *Dermatophilus congolensis* is frequently confused with demodectic mange. In this paper the clinical differences are indicated.

. The author has observed a large number of cases of demodectic mange in native, European, and Indian cattle. The clinical features are:—The presence of comedones, varying in size from a pin's head to a hen's egg, containing brownish material; no crusts; the disease is slow and chronic; there is no effect on the general condition of the animal; young animals do not suffer; the disease occurs in both the dry and the rainy seasons.

In tropical dermatitis, on the contrary, there are crusts; rapid spread; complications which may result in death; young animals are affected as well as adults; the disease is only found to occur in its acute form during the rainy season.

Demodectic mange is controlled by regular dipping in arsenical preparations. The treatment for tropical dermatitis consists in the use of an ointment composed of 5 per cent. carbolic acid in vaselin.

TRANSMISSION OF CATTLE TRYPANOSOMES BY FLIES OTHER THAN TSETSE.

H. E. HORNBY. *Rhodesia Agric. Journ.* Vol. XIV., No. 2.
April 1917. Pp. 168-176. 1 Plate (2 Figures).

Reasons are adduced for assuming that trypanosomes may be transmitted by biting flies other than tsetse. In 1914 the writer inoculated a dog with *T. brucei* vel *rhodesiense*, with the result that many trypanosomes appeared in the blood. Cohabiting with the inoculated dog was another, and both animals were much worried by *Stomoxys* and haematophagous muscids. The uninoculated dog fell sick, and examination of its blood revealed numerous trypanosomes typical of those found in the inoculated animal.

To show how irrational it is to attribute the whole of a large outbreak of trypanosomiasis to hypothetical tsetse, Hornby mentions that he has camped for a month with three hundred cattle in what was actually a thin "fly" belt, where several times a week he saw tsetse within three miles of the kraal, and twice caught flies at the kraal itself, yet during that time less than twenty cattle were fly-struck. Knowing that of any *Glossina* population less than 5 per cent. are infective, is it not absurd, he asks, to attribute hundreds of cases of trypanosomiasis to the tsetse that no one has ever seen?

Hornby also states that he knows of more than one estate where, since the danger from mechanical infection has been realised and measures taken to isolate all fly-struck cattle, no fresh cases occurred during last summer, although during each of the three previous summers severe outbreaks had been the rule.

In a note appended to the paper the C. V. S. says that though it may be true for some areas that in certain circumstances trypanosomiasis is transmitted by biting flies other than tsetse, it is a very rare

occurrence in Southern Rhodesia, where, as the result of the practical observation—no tsetse, no trypanosomiasis—it has not been found necessary to impose any veterinary regulations in respect of this disease.

THE LIFE-HISTORY OF *HYPODERMA BOVIS* AND *H. LINEATUM*. S. HADWEN.
Journ. Amer. Vet. Med. Assoc. Vol. LI., No. 4. July 1917.
Pp. 541-544.

OBSERVATIONS ON THE DISTRIBUTION OF WARBLE FLIES IN OHIO. D. C. MOTE. *Ohio Journ. Sci.* Vol. XVII., No. 5. March 1917.
Pp. 169-176. 1 Map, 1 Figure, 3 Tables.

Hadwen's notes are based on observations made at Agassiz, British Columbia.

"*Hypoderma lineatum* lays its eggs as early as 15th April, but the usual laying period is during the month of May. At Agassiz they have never been captured later than 30th May. *Hypoderma bovis* begins in the early part of June and continues up to the beginning of August. Between the last appearance of *H. lineatum* and the first of *H. bovis* there is usually a period of ten days, when the cattle are immune from attack of either species. *H. bovis* frightens cattle much more than *H. lineatum*. The eggs take about a week to hatch; the larvæ bore through the skin in the coarser porous parts, taking several hours in the process; at this stage they are rather less than 1 mm. long. The lesions resulting from this penetration are caused partly by bacterial invasion and partly by anaphylactic reactions, those produced by *H. lineatum* being more severe. For the skin lesions I have proposed the name of *hypodermal rash*. At this point there is a hiatus in the life-history, as it is not positively known how the larvæ reach the oesophagus, where they are subsequently found; most likely they travel in the loose connective tissues under the skin up to the region of the throat and into the oesophagus where the muscles bifurcate. Passing down the oesophagus they follow the submucosa, and are almost always found lying along the long axis of the canal. Whilst in the oesophagus small oedematous swellings are found surrounding the grubs; these are sterile, and are anaphylactic in character; the exudate contains large numbers of eosinophile leucocytes, but no pus cells. The earliest record made at Agassiz was on 15th August, when a larva, 3·4 mm., was found, and several slightly larger. According to Carpenter, continental observers have found them smaller than this. *H. lineatum* makes its appearance in the backs of cattle about 15th December, and *H. bovis* about a month later. The larvæ at this time have grown to about 1·5 cm., and are of the same size in the neural canal and under the skin which they have just reached. . . . The life-histories overlap at this period, making it difficult to follow the migration, but in the latter part of the season (the middle of March) the last larvæ to leave the gullet are at the paunch end. They pass under the pleura and go to the neural canal

either up the crura of the diaphragm or up the posterior border of the ribs, entering the canal by the posterior foramen; from there they descend the canal under the dura mater, emerge again through the foramen and reach the back, forming the characteristic swellings commonly called warbles. The larvae follow connective tissue exclusively, and no larvae have been discovered in muscular tissue. The mature larvae leave the animals' backs from the early part of the year up to the first days of July. The periods for the two species have not been fully worked out; but, judging from what records we have of the pupal period and the time of the year the flies are about, *H. lineatum* begins to emerge in February and finishes about 1st May. *H. bovis* begins about 1st May and ends approximately on 1st July. The average pupal period for *H. bovis* is 32·5 days, and for *H. lineatum* a little less. The duration of the life of the flies is short, seeing that they cannot feed. This life-history applies to Agassiz, British Columbia; doubtless in other countries variations will be noticed, but the period spent by the larvae within the host must be of the same duration, seeing that animals' temperatures are the same the world over."

Mote's investigation was undertaken to ascertain whether both *Hypoderma bovis* and *H. lineata* occur in the State of Ohio, which species is of most economic importance, their distribution, and the conditions favouring increase or decrease.

Hypoderma bovis formed 83·5 per cent. of the total warble flies collected in the State of Ohio, and predominates in the north-eastern States of the Union. In the western two-thirds of the States its distribution is somewhat restricted and confined to definite areas. *H. lineata* is probably present in every State, but is apparently most numerous in the south and central west. Both species are more numerous in the north-eastern section of Ohio, the greatest freedom from infestation being in the north-western section of the State.

Normally *H. lineata* is the earlier to appear. In the present investigation the earliest specimen of *H. lineata* was received on 25th March, and the latest in the early part of May. The earliest specimen of *H. bovis* was received early in March; the latest in June. It is stated the native cattle are free from infestation. Young animals are more liable to infestation than the old.

AUTO-INOCULATION AND PRIMARY DEVELOPMENT, IN THE BUCCAL MUCOUS MEMBRANE, OF THE LARVÆ OF *GASTROPHILUS EQUI* (Auto-inoculation et développement primaire, dans les muqueuses buccales, de la larve du Gastrophile équin (Estre du cheval)). E. ROUBAUD.
C. R. Acad. Sci. Vol. CLXIV., No. 11. 12th March 1917.
 Pp. 453-456.

The problem of how the larvae of *Gastrophilus equi* (*intestinalis* De Geer) reach the digestive tract of the horse has not received the

attention it deserves. According to some authors (Numan, Brauer) the young larvæ gain the mouth and nose by their own efforts; but the greater number of authorities consider that they are introduced into the mouth by licking, and are then swallowed. It has been explained that licking is induced by a special pruritis caused by the presence of the larvæ on the skin. Cholodkovsky (*Zool. Anz.*, vol. xxxiii. 1908, and vol. xxxvi. 1910) considers that the larvæ, on leaving the egg, penetrate the epidermis of the horse, thus producing an itching which causes the animal to bite the skin, in this way extracting the larvæ and ingesting them. Portchinsky (*Monographie du Grand Cestre du cheval*, 1907 (in Russian); and *Zool. Anz.*, vol. xxxv. p. 669, 1910) holds, however, that only some of the larvæ enter the epidermis. These produce the irritation which induces licking, by which other larvæ, still on the surface, are introduced into the alimentary canal.

Roubaud's researches have led him to different conclusions. He finds that the eggs of *Gastrophilus* do not hatch spontaneously, the ripe eggs waiting, perhaps several weeks, to liberate their larvæ only on mechanical contact with, say, the lips, tongue, or teeth of the horse. The primary larvæ, freed by contact with the mucous membrane of the lips or gums, immediately bury themselves under the epithelium. The larvæ migrate and grow under the epithelium, and, when they have attained a certain size, become free and are swallowed.

Gastrophilus larvæ, unlike those of *Hypoderma*, cannot penetrate the skin, upon which they quickly die.

PARASITIC MANGE (Les gaz sulfureux. (1) Dans le traitement de la gale du cheval et autres affections de la peau; (2) Dans les mesures préventives contre ces maladies et la désinfection générale). L. LÉPINAY. *Rev. Path. Comp.* Vol. XVII., No. 133. April 1917. Pp. (16) 80-(33) 97. 4 Figures. (Lépinay's Treatment of Mange of the Horse by Sulphurous Anhydride.) VIGEL and CHOLLET. *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 267-276. 12 Figures. (Quelques réflexions sur la gale du cheval et son traitement.) DOUVILLE. *Rev. Gén. Méd. Vet.* Vol. XXVI., No. 306. June 1917. Pp. 225-237. (Quelques notes sur le traitement des chevaux galeux.) L. LÉPINAY. *Rev. Path. Comp.* Vol. XVII., No. 135. June 1917. P. 10 (158). (Some Notes on Skin Diseases of the Horse.) J. F. D. TUTT. *Vet. News.* Vol. XIV., No. 702. 16th June 1917. Pp. 240-243. (Mange in the Horse.) A. S. HEAD. *Ibid.* Vol. XIV., No. 701. 9th June 1917. P. 232. (Organisation du service dans un dépôt de chevaux galeux traités par la méthode du Bain-Piscine.) GAY. *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10.

30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 152-155. (Notes complémentaires sur le traitement de la gale par les bains.) DESCRAZEUX and LAUGIER. *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 267-271. (Description d'une piscine anglaise destinée à donner des bains aux chevaux de l'armée britannique.) HAAS. *Rec. Méd. Vét.* Vol. XCII., No. 16. 30th August 1917. *Bull. Soc. Centr. Méd. Vét.* Pp. 324-328. 3 Figures.

The employment of SO_2 as a disinfectant has been opposed, especially by Germans, mainly because a small quantity of the gas produces rapid rarefaction of the oxygen in the air, and because it has a weak penetrating power. Moreover, the gas has little action on bacteria, and still less on spores.

Nevertheless, Lépinay and his confrères have applied sulphur fumigation with success in the treatment of parasitic mange in horses. The worst cases of mange were chosen; half of them were clipped, the others being left unclipped. A microscopic examination of scrapings was made. Each animal was subjected to sulphur fumigation, and then placed in a carefully disinfected stable.

The sulphur fumes were circulated through a specially constructed box (2 m. \times 0·8 m. \times 1·75 m.), in which the horse was placed with his head through the window; a collarette of oiled cloth attached to the edge of the window fitting closely round the neck. The ideal arrangement would be to completely enclose the horse in the box and provide him with a gas-mask. The concentration of the gas, the length of the operation, and the need for surveillance of the animal, however, makes this impossible.

The collarette of oiled cloth gave entire satisfaction. The head and that part of the neck not operated on by the gas were vigorously rubbed with a 10 per cent. solution of cresyl in oil.

In order to guard against re-infection from the auditory passage (see Henry, this *Review*, Vol. I. p. 260), a 3 per cent. emulsion of cresyl was poured into the ears, with massage of the base.

The success of his experiment permitted Lépinay to conclude that the treatment of mange in horses by anhydrous SO_2 is an efficacious, simple, inoffensive, rapid, and economical method. At the end of three days the clinical signs of mange had disappeared, the animal had ceased to rub himself, the skin had become normal, and there were 100 per cent. of cures. The animals were subjected to one fumigation of two hours' duration, and all the necessary treatment (two washings and the fumigation) can be given in the space of one week.

The treatment may be summarised as follows :—

1. Clip the horse.
2. Wash thoroughly with a solution of carbonate of sodium or potash soap, using a stiff brush.
3. When the skin is thoroughly dry—next day or the day after—fumigate for two hours.
4. Dress the head, neck, and ears.
5. Wash for the second time, three days after the fumigation.

Douville has derived his experience from being for eighteen months connected with a special mange dépôt. He concurs with Fayet in the importance of early diagnosis. The first symptoms of pruritis should arouse suspicion. Digital examination may lead to the detection of small granulations consisting of agglutinated crusts. If these are rubbed or scratched the horse evinces pleasure. In regard to treatment, Douville finds that pomades and the H.P.B. (oil, petroleum, benzine) mixture have objectionable properties. He has used, and gives preference to, the alkaline-petroleum emulsion made according to the formula of Schelameur:—Water, 1 litre; soda crystals, 30 grammes; petroleum, 300 grammes. It is important that this should be in a state of perfect emulsion at the time of application. The dressing is renewed every six days, and six or seven applications are sufficient. Properly applied, the emulsion produces very little irritation, causes no depilation, and does not interfere with the action of the skin. Good food and a certain amount of exercise are recommended as part of the treatment.

Lépinay calls attention to the movements of the lips when a horse affected with mange is scratched. The phenomenon can be demonstrated in horses with particularly sensitive skins unaffected with mange, but the movements are not the same as in a horse with mange. In the latter the trembling of the lips is more considerable, and the animal opens the mouth and lets fall his food.

Captain Tutt reports that the best results in the treatment of mange have been obtained by the use of sulphur, 4 ozs.; ol. picis, 1 oz.; and ol. cetacei, 1 quart.

Major Head criticises the suggested "open-air" treatment (see abstract of a paper by Berton, this *Review*, Vol. I. p. 144). "That a quantity of horses suffering from any form of true mange would recover if turned out and given good food without treatment is a dangerous suggestion to make, and contrary to all my experience." The author believes that the calcium-sulphide dip, heated to 100° F., and the horse put through once a week for five weeks, will cure any form of mange if the mixture is properly prepared. He urges that more time should be spent in studying the prevention of the disease

and the habits of the parasite, and less in striving for the unobtainable —“a certain cure.”

Gay describes the organisation of a special dépôt for the administration of the Descazeaux treatment to horses affected with mange. The treatment comprises four periods:—(1) Treatment on arrival at the dépôt; (2) special treatment by the “bain-piscine” method; (3) observation of horses presumably cured; (4) evacuation from the dépôt.

After more than a year of its application, Descazeaux and Laugier draw certain conclusions respecting the treatment of mange by baths. Experience has shown that the method may be employed in all seasons of the year, though sometimes a slight dermatitis has been produced in winter. This may be avoided by increasing the interval between the successive baths. The facility with which the bath treatment can be applied economises labour. The average period (including therapeutic treatment, observation, and quarantine) necessary for the course of treatment is about two months. In generalised mange the therapeutic treatment varies from thirty-two days in summer to forty days in winter. The general results of the treatment have been very satisfactory.

Descazeaux and Laugier have had some experience of the “open-air” treatment of mange, and are not able to speak in its favour.

In his article Haas gives a description and plans of the bath used for the horses of the British Expeditionary Force.

SHEEP-SCAB. A. E. MOORE. *Agric. Gaz., Canada.* Vol. IV., No. 4.
April 1917. Pp. 262-265.

MANGE IN SHEEP (Gale du mouton). C. RÈNE. *Progrès Agricole.* Vol. XXXI., No. 1528. 29th April 1917. P. 200.

The official dip, as described by Moore, is prepared in the following manner:—Ten pounds of unslaked lime is slaked in enough water to make a paste. To this 24 lbs. of flowers of sulphur are added, and the whole thoroughly mixed to the consistency of mortar. The paste is then put into 30 gallons of boiling water and boiled for three hours, water being added to maintain the same proportion. The resulting dark-chocolate fluid is decanted, made up to 100 gallons by the addition of warm water, and used as a dip. The dipping may be effected either by swimming the sheep through vats containing the fluid or by holding the animals in small tanks. In the latter case, care must be taken that none of the dip enters the nostrils. The sheep, which should have been previously clipped, must remain in the dip for at least two-minutes. The dip should be warm (100° F. to 105° F.). Two dippings are necessary, with an interval of from ten to fourteen days between.

them, in order to allow of the hatching of eggs which are not affected by the dip.

The formula recommended by Rène for a dip for 100 sheep is as follows:—Arsenious acid, 2 lbs.; zinc sulphate, 10 lbs.; aloes, 1 lb.; water, 20 gallons. The sheep should be scrubbed while in the dip, and should remain in it from one to five minutes. Before the dip is used the sheep are shorn, well soaped, and the crusts thoroughly softened.

AORTIC ANEURYSMS IN DOGS, WITH THE REPORT OF SIX CASES. S. R. HAYTHORN and A. H. RYAN. *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 411-423. 2 Plates (12 Figures).

Aortic aneurysms in dogs are apparently rare. The authors have been able to find records of four cases only. Trevor (*Vet. Journ.*, 1893, vol. xxxvi. p. 96) reported the death of a dog from rupture of an aneurysm through the lung into the pleural cavity. The dilatation of the aorta was the size of an artichoke. Pecus (*Journ. Méd. Vet.*, 1902, p. 301) states that he found a ruptured aneurysm at the beginning of the aorta posteriorly. No cause is given, but the dog had been operated on three years before for urethral calculus, and a permanent fistula remained. The aneurysm was the size of a small nut, and had ruptured into the pericardium. There was hypertrophy of the heart, focal sclerotic myocarditis, pre-existing pericarditis with adhesions, passive congestion of the liver, chronic induration of the kidneys, and extreme general emaciation. Pease (*Veterinarian*, 1901, vol. lxxiv. p. 134) reported the case of a dog with general anaemia, leucocytosis, and the presence of nematode ova. After three months death resulted from rupture of an aneurysm of the posterior wall of the aorta. The sac was irregular and atheromatous, and adventitial nodules contained "Spiroptera sanguinolenta." Similar parasites were found in a large cyst of the oesophagus. Bel (*Journ. Méd. Vét. et Zootech.*, 1907, vol. xi. p. 587) describes a ruptured aneurysm in a dog which died suddenly from haemorrhage. The aneurysm was in the central part of the aorta on the right side. About 2 cm. beyond the rupture four other tumours were present, one as large as a pigeon's egg. These contained bloody pus and five or six "Spiroptera sanguinolenta."

In three of the six cases now recorded by Haythorn and Ryan *Spirocercus sanguinolenta* (formerly known as "Spiroptera sanguinolenta") was associated with the lesions. The authors believe that the other three cases were also due to the nematode, though neither the worms nor their ova were demonstrated.

Very briefly described, the cases were as follows:—No. 1. Adult female dog. Aneurysm of the thoracic aorta with intimal polypi;

œsophageal cyst filled with *Spirocerca sanguinolenta*; granulomatous mass in the mediastinum; hypertrophy of the heart; *Filaria immitis* in the right heart cavity; papillary intimal proliferation of pulmonary artery. No. 2. Moderate-sized short-haired dog, with wolf-like head. Aneurysm of thoracic aorta; adventitial and medial nodules of aorta; *Spirocerca sanguinolenta* in aortic nodules; œsophageal cyst containing *Spirocerca sanguinolenta*. No. 3. Old fox terrier. Aneurysm of thoracic aorta; adventitial and medial nodules of aorta; *Spirocerca sanguinolenta* in aortic nodules; œsophageal cyst containing *Spirocerca sanguinolenta*; hypertrophy of the heart; subpleural tubercles. No. 4. Double aneurysm of thoracic aorta; heart normal; no worms found. No. 5. Aneurysm of thoracic aorta; heart appeared normal; no worms found. No. 6. Aneurysm of abdominal aorta; nodules of aortic wall; œsophageal cyst containing *Spirocerca sanguinolenta*; heart was very large, but contained no worms.

A detailed description of each case is given, with an account of the microscopic examination of the lesions. The authors are of opinion that destruction of the media of the aorta is due to the action of toxic substances produced by the parasite. They consider it remarkable that so little has been written on aneurysms in dogs, for if six cases can be found in one locality in one year's time, it is safe to suppose that a large percentage of dogs in Mobile (Alabama, U.S.A.) are infected with *Spirocerca sanguinolenta*, and that many of them have aneurysms. It is also remarkable that so little about the occurrence of this parasite in America is available in the literature.

A NEW TREATMENT FOR LICE IN HORSES (*Traitemenr nouveau de la phtiriase équine*). MANGIN, *Rec. Méd. Vét.* Vol. XCII., No. 12. 30th June 1917. *Bull. Soc. Centr. Méd. Vét.* 7th June 1917. Pp. 239-242.

NOTES IN REGARD TO HORSE LICE, *TRICHODECTES* AND *HÆMATOPINUS*.
M. C. HALL. *Journ. Amer. Vet. Med. Assoc.* Vol. LI, No. 4. July 1917. Pp. 494-504. 3 Figures.

Mangin claims simplicity and efficacy for a method devised by him for the destruction of lice on horses. The infested horse is washed with a mixture made according to the following formula:—

Eau de Javel	400 c.c.
Potash soft soap	200 grammes.
Water	10 litres.

These quantities suffice for one horse. The soap is dissolved in hot water, and the eau de Javel (hypochlorite of sodium) is added immedi-

ately before the washing begins. The wash is applied at a temperature which is comfortable to the hand.

Care must be taken to apply the wash to the whole body, and to ensure its contact with the hair for some little time. A specially constructed bath, similar to that used by Descazeaux in the treatment of mange, would be useful. In addition to killing the lice, the wash also destroys the nits.

Hall's observations have been made on the horses purchased for serum work at the laboratories of Messrs. Parke, Davis & Co., Detroit. Of twenty-four cases of lice-infestation in the horse, twenty-two were infested with the sucking louse, *Hæmatopinus asini*, and only two with the biting louse, *Trichodectes pilosus*. In experiments on the viability of the louse off its host, *Hæmatopinus* lived one or two days, while *Trichodectes* lived from five to eight days. Hair may possibly furnish food for the biting lice, whereas the sucking lice are deprived of food by the death of their host. Tests, though incomplete, seem to indicate that *Trichodectes* is more resistant to insecticidal treatment than is *Hæmatopinus*.

PATHOLOGY AND BACTERIOLOGY.

THE LIFE-HISTORY OF BACTERIA. E. C. HORT. *Brit. Med. Journ.* No. 2940. 5th May 1917. Pp. 571-575. 6 Plates, 91 Figures.

This communication is of great importance as throwing light on the mode of reproduction of bacteria and the possible nature of filterable viruses. According to current bacteriological theory bacteria are only capable of reproduction (apart from endosporulation of a special type) by a simple process of transverse binary fission. The author has already brought forward evidence which strongly suggested that the life-cycle of certain of the "lower" bacteria is one of great complexity (*Brit. Med. Journ.* May 1914, April 1915, 27th March and 24th April 1915; British Medical Association Meeting, Aberdeen, July 1914; *Journ. Roy. Army Med. Corps*, February 1916, September 1916).

From this evidence it was difficult to escape from the conclusion that under parasitic conditions simple binary fission is only one of the phases of the life-cycle which includes an invisible, or almost invisible, filterable stage.

In the present paper further evidence is brought forward based on observations made on the enteric group of bacteria. The organisms made use of were *B. typhosus*, *B. paratyphosus A.*, *B. paratyphosus B.*, *B. Shiga-Kruze*, *B. Y. of Hiss*, and *B. Flexner*.

In order to reduce chances of error to a minimum, rigid precautions were taken against contamination, each strain was subjected to searching identification, and frequent re-platings were made and the process of examination re-started from fresh single non-lactose fermenting colonies on MacConkey's medium.

In all broth cultures simple binary fission was the predominating mode of reproduction, and mainly held the field in the study of single living organisms on the warm stage on solid media. Observation on the warm stage appeared to show that reproduction by gemmation occurs freely in conjunction with ordinary binary fission only so long as growth proceeds in the thin layer of broth on the coverslip, and largely comes to an end when colonies begin to form on the solid medium.

The number of types which could be seen in any acid culture exceeded 100. The photographs illustrating the paper, therefore, cannot be comprehensive. Gemmation may be terminal, median, or superficial. Sagittal as well as transverse segmentation of buds was observed. The presence of extremely minute buds is probably explanatory of the apparent filterability through Chamberland filters of such relatively large organisms as the *B. bronchosepticus*.

"From these morphological observations it is clear that bacteria can, and do, reproduce themselves in other ways than by simple binary fission, and that the life-cycle in some cases includes an invisible, or almost invisible, phase. Our present conception, therefore, of the rôle played by bacteria, both as saprophytes and as causal agents of disease and its sequels, will have to be profoundly modified."

CANCER OF THE THYROID GLAND (Le cancer du corps thyroïde). G. PETIT. *Rec. Méd. Vét.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 165-179. 12 Figures.

In a previous paper (*Rec. Méd. Vét.*, 15th June 1916, p. 326) Professor Petit has already suggested the following classification of thyroid cancers:—

1. Arising in the thyroid gland itself.
 - (a) *Typical thyroid cancers.*
 - (b) *Atypical thyroid cancers.*
2. Developing at the expense of the accessory thyroids.
Aberrant thyroid cancers.
3. Arising from the parathyroids.
Parathyroid cancers.
4. Resulting from embryonic inclusion or propagation.
 - (a) *Malpighian cancers.*
 - (b) *Branchiogenous carcinomata (very rare).*

The present paper is concerned with atypical thyroid cancers.

In the horse the rarity of malignant thyroid cancer is striking when contrasted with the occurrence of benign thyroid adenoma, or goitre, which seems to represent a pre-cancerous condition. Diagnosis is delicate and should be circumspect unless evidence points clearly to goitre.

The author figures a thyroid epithelioma in a dog where a bud of cancerous growth has entered a vein. He has noticed that large thyroid cancers have a remarkable tendency to invade veins.

In domestic animals in which the two lobes of the thyroid are not united by an isthmus, cancer is liable to be bilateral.

When generalisation occurs it takes place by way of the bloodstream, and the lungs are the common and principal site of the metastases.

Typical thyroid cancer offers the characteristic that its cells line cavities and so form neo-vesicles containing colloid material; thus mimicking the structure of the gland from which it arose. Metastatic tumours of typical thyroid cancer repeat this structural peculiarity.

CHRONIC INDURATIVE NEPHRITIS AND ITS RELATIONSHIP TO ASCITES IN
THE DOG. W. J. CROCKER. *Cornell Veterinarian*. Vol. VII.,
No. 3. July 1917. Pp. 209-217.

The writer contends that though the assumption that disease of the heart and liver are generally responsible for ascites in the dog is not untrue, a chronic indurative nephritis is primary in the majority of cases, and that the lesions of the heart are secondary and those of the liver tertiary.

"Cardiac valvular lesions and cardiac hypertrophy with subsequent lesions of the heart are due to chronic indurative nephritis, except perhaps in hunting-dogs, in which cases it must not be entirely excluded. Chronic cardiac lesions are in direct proportion to the quality and quantity of the kidney lesions, except in rare instances, and in extent they vary with the age of the dog."

The cause of chronic indurative nephritis has not been satisfactorily proved, but the author appears to incline to the view that the mode of feeding the domestic dog is responsible.

Though ascites may be induced in other ways, it most commonly indicates the presence of chronic hepatic, cardiac, and nephritic lesions.

PHARMACOLOGY AND THERAPEUTICS.

SODII CACODYLAS (U. S. P. IX.): SODIUM CACODYLATE. E. L. QUITMAN.
Amer. Journ. Vet. Med. Vol. XII., No. 5. May 1917. Pp. 301-303.

Sodium cacodylate (sodium dimethylarsenate, $\text{Na}(\text{CH}_3)_2\text{AsO}_2$) occurs as white, odourless, deliquescent prisms, or as a granular powder, and dissolves in about one-half part of water and in about two and one-half parts of alcohol at 25°C . It contains 46·8 per cent. of arsenic, equivalent to 61·8 per cent. of As_2O_3 . Sodium cacodylate is administered by the mouth, per rectum, hypodermically, and intravenously. In the stomach and rectum it may undergo chemical changes resulting in the rapid liberation of arsenic, which may produce toxic effects.

Hypodermic administration is the best, and by this route the drug is practically non-toxic. If it is used for the destruction of blood parasites, it should be administered intravenously.

The arsenic ion in sodium cacodylate is liberated very slowly in the body, and is eliminated as arsenates in the urine.

The hypodermic dose for horses and cattle is a $\frac{1}{2}$ to 2 drachms; 1 to 3 grains for dogs. Quitman dissolves 45 grains in 1 oz. of distilled water and repeats the dose every three days (if necessary) in acute affections of the horse. The solution should be sterile, and made fresh for each injection. For administration to dogs the ampoules made for human use are most convenient.

The writer claims that sodium cacodylate is by far the safest of the complex class of arsenical preparations, and he thinks that it will come into more and more extensive use as its therapeutic value becomes known.

Sodium cacodylate is of great value to improve nutrition in cachetic conditions and to increase resistance to various diseases, such as influenza, pneumonia, the malarial type of fevers, joint infection as a sequel to influenza, chronic rheumatism, and as a tonic. With the help of this drug, severe, but not dangerously complicated, influenza in the horse is usually cured in three days. In chronic skin diseases of different types the author has had most gratifying results. In strangles, if administered early enough, the drug often prevents suppuration. Satisfactory results have not been obtained in canine distemper. In haemorrhagic septicæmia of both cattle and horses very satisfactory results have been reported.

PHYSIOLOGY.

STUDIES IN MILK SECRETION: I. THE EFFECT OF NUTRITION ON YIELD AND COMPOSITION. II. THE RELATION OF THE GLANDS OF INTERNAL SECRETION TO MILK PRODUCTION. J. HAMMOND and J. C. HAWK. *Journ. Agric. Sci.* Vol. VIII. Part 2. March 1917. Pp. 139-153. 2 Figures, 8 Tables.

SOME ASPECTS OF THE PHYSIOLOGY OF MANMARY SECRETION. R. L. HILL. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 642-654. 8 Tables.

The experiments conducted by Hammond and Hawk gave the following results:—

“I. As a result of withholding food for a few days, together with an injection of phloridzin, thereby reducing the nutrition, the daily yield of milk in goats was diminished, and in one case the flow was actually stopped. On giving food again the yield returned almost to normal within a few days.

“II. As the daily yield of milk diminished under these conditions so the percentage of fat in the milk rose. Limitation of the available nutriment in the body (change from a high to low state of nutrition) did not reduce the percentage of lactose or protein in the milk (Paton and Cathcart), but reduced the quantity of milk (together with the amount of protein, sugar, and salts) produced. The secretion of fat was not at first affected by the change in metabolism, and as a consequence milk rich in fat was produced.

“III. The amount of fat secreted per day under these conditions of diminishing yield was, however, not constant but became reduced, possibly as a secondary effect of the decreased secretion taking place in the gland cells.

“IV. On again giving food to animals in such a reduced state of nutrition, the percentage of fat decreased as the yield increased, in some cases to such an extent that it was below that of the normal milk before the experiment began.”

Experiments with pituitary extract and adrenalin led to the following conclusions:—

“I. The flow of milk produced as a result of an injection of pituitary extract varies with the state of nutrition of the injected animal.

“II. This variation (due to nutrition) is not so great as that produced in the case of the morning or the daily yields, indicating that the action of the pituitary extract is on some more stable (storage) quantity.

“III. The percentage of fat of the pituitary milk is increased by the state of lowered nutrition in the same way as that of the normal milk.

"IV. Injections of adrenalin, though resembling pituitary extract in causing hyperglycæmia, differ from them in having no immediate action on milk secretion.

"V. Injections of adrenalin have a secondary effect on milk secretion, causing a decrease in the amount of milk produced for a period of a day following its injection.

"VI. The percentage of fat in the milk from the period following an injection of adrenalin is above normal, although the actual amount contained is somewhat below normal.

"VII. The rate of the milk flow is very susceptible to changes in the sugar metabolism of the animal."

Hill's observations have been made on goats to which pituitary extract was administered. "The injection of pituitary extract into lactating animals produces an immediate secretion of milk even though the mammary gland was hand milked just preceding the injection. The milk secreted as a result of pituitary injections has a supernormal fat content, but the amount of milk, and usually, but not invariably, the fat it contains, is decreased at the next milking period. The total daily secretion of milk is only slightly altered by the injection of pituitary extract. The mammary gland of a goat does not respond to more than two injections of pituitrine given at two-hour intervals." A temporary tolerance may be produced by continued injections, but this tolerance may entirely disappear by the next lactation period. Similar results have been obtained in cats, dogs, goats, cows, and the human subject. Though there seems good evidence in support of both the glandular and muscular action of pituitrine, Hill's researches lent more support to the glandular theory of action.

POULTRY DISEASES.

A COMPARATIVE STUDY OF *BACTERIUM PULLORUM* RETTGER AND *BACTERIUM SANGUINARIUM* MOORE. L. F. RETTGER and S. A. KOSER. *Journ. Med. Res.* Vol. XXXV., No. 3. January 1917. Pp. 443-458. 8 Tables.

A STUDY OF THE FERMENTING PROPERTIES OF *BACT. PULLORUM* RETTGER AND *BACT. SANGUINARIUM* MOORE. S. A. GOLDBERG. *Journ. Amer. Vet. Med. Assoc.* Vol. LI, No. 2. May 1917. Pp. 203-210.

Some doubt having been felt regarding the individuality of the organisms associated with bacillary white diarrhoea and fowl typhoid, experiments have been made upon their fermentative and other properties.

Rettger and Koser conclude that *B. pullorum* and *B. sanguinarium* are two separate and distinct types, and each bears a specific relationship to the disease with which it has been associated in the past, namely, bacillary white diarrhoea and fowl typhoid respectively. While both organisms are pathogenic to fowls of all ages in experimental inoculation, *B. pullorum* manifests itself only as the cause of natural endemic infection in young chicks; while *B. sanguinarium* attacks fowls of different ages, although it is of little, if any, significance as the cause of epidemic disease in very young chicks.

The observations of Goldberg go to show that *B. pullorum* produces gas in various carbohydrates, while *B. sanguinarium* lacks this power in any of the carbohydrates used. This difference appears to be constant. Judging from the present classification of species of bacteria, this difference in gas-production as well as their different actions on milk, maltose, dulcite, dextrin, and iso-dulcite seem to indicate that these two organisms are two distinct species of bacteria.

SEROLOGY AND IMMUNOLOGY.

ANAPHYLAXIS IN CATTLE AND SHEEP PRODUCED BY THE LARVAE OF
HYPODERMA BOVIS, *H. LINEATUM* AND *ŒSTRUS OVIS*. S. HADWEN
and E. A. BRUCE. *Journ. Amer. Vet. Med. Assoc.* Vol. L, No. 1.
April 1917. Pp. 15-41. 15 Figures.

The authors define the condition under discussion as "a sensitiveness induced by warble larvae living in the tissues causing the host animal to become sensitive. When the larvae are removed from the animal's own body (or from another's) and the protein material contained in the larvae is injected into the jugular of a sensitive animal, anaphylactic shock results." They have proved that the rupturing of the warble larvae in the animal's own back may produce the same results. It is assumed that the material which produces sensitisation is caused by the larval excretions. That the *Hypoderma* larvae are themselves not toxic is shown by the absence of toxic effects when they are crushed and injected into animals of a species different from that of their host.

In these experiments extract of *Hypoderma* larvae was either injected into the jugular or instilled into the eye. In some of the experiments a few drops of the extract were injected into the anus, or placed on the lips of the vulva.

Both "acute" and "chronic" forms of anaphylaxis, according to the definition given by Richet (*Ann. Inst. Pasteur*, 1910, No. 8, pp. 609-652), were produced.

"The symptoms in 'acute' anaphylaxis were immediate; the first noticeable sign being an exceedingly tired look, succeeded almost immediately by salivation, tears, and defæcation, then by signs of asphyxia and death. In the 'chronic' form the symptoms were a little less rapid and not so severe; in addition, there were cedemas, especially of the eyelids and anus, and marked irritation of the skin.

"Small animals were sensitised with warble extracts and showed signs of anaphylaxis following the second injection.

"Eye and other local reactions were obtained with extracts applied to the mucous membranes. In cattle the reaction was specific for extracts of *Hypoderma*, and in the horse for *Gastrophilus*.

"It would appear probable that similar reactions will be obtained in other animals with their own parasites."

It appears to be the case that animals which recover enjoy an immunity for varying periods, but upon this point further observation is needed.

TRANSFORMATION OF PSEUDO-GLOBULIN INTO EUGLOBULIN. W. N. BERG.

Journ. Agric. Res. Vol. VIII., No. 12. 19th March 1917.
Pp. 449-456. 2 Tables.

Banzhaf (*Proc. Soc. Exp. Biol. and Med.*, 1908, vol. vi., No. 1, pp. 8, 9; *Collected Studies Bur. Lab. Dept. Health, City of New York*, 1912-13, vol. vii., pp. 114-116; *Ibid.*, 1915, vol. viii., pp. 208-212) has stated that when diphtheria serum is heated as it is in the preparation of antitoxin, part of the pseudo-globulin is transformed into euglobulin. This transformation has both a practical and a theoretical interest. It facilitates the concentration of the antitoxin present in the serum by removing protein without removing any of the antitoxin, so that the final product contains all the antitoxin associated with much less protein. This is desirable because certain of the serum proteins have very little therapeutic value.

On the theoretical side, the fact that pseudo-globulin can be transformed into euglobulin without affecting the total number of antitoxin units is almost conclusive proof that the antitoxin is a substance separate from pseudo-globulin.

The present paper contains an account of experiments on four horse serums—two anthrax, one diphtheria, and one tetanus. The transformation of pseudo-globulin into euglobulin was observed in the four serums when they had been heated for thirty minutes at 60° C. in the presence of 30 per cent. saturated ammonium sulphate. In some instances the amounts transformed were considerable, although in one of the serums the amount was so small as to indicate that the transformation does not take place in all serums.

The methods of analysis were improved by the use of the centrifuge as a means of separating globulin precipitates from their filtrates. The precipitations in the analyses were made at the same dilutions as in the precipitations of globulin for therapeutic use.

The work was completed some months before the recent investigations of Homer (*Biochem. Journ.*, 1916, vol. x. pp. 280-307; *Journ. Hyg.*, 1916, vol. xv. pp. 388-400) came to the notice of the author. The author thinks that Homer's failure to observe the conversion of pseudo-globulin into euglobulin when serum mixtures were heated to 61° C. or 63° C. was probably due to the use of analytical technique that was not delicate enough, and to the errors incidental to the handling of large amounts of serum mixtures.

BLACKLEG FILTRATE. A. EICHHORN. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 406-413. *Amer. Journ. Vet. Med.* Vol. XII., No. 6. June 1917. Pp. 375-378.

The most common method of vaccination against blackleg at present employed, not only in the United States but also in other countries where the disease is prevalent, consists of the injection of an attenuated virus either in powder or pellet form. The results obtained by this method might be considered highly satisfactory, although losses from vaccination and insufficient immunity have been observed from time to time. Further, complications, such as necrosis of the tail, etc., are not unusual.

The shortcomings of the blackleg vaccine lie mainly in the fact that in its production the spore contents of the product cannot be accurately estimated. Investigators have directed their attention towards developing other methods of vaccination in which the deficiencies of the usual method might be overcome. In Japan, at the present time, a germ-free filtrate is used almost uniformly. In order to determine the value of this method of immunisation, Eichhorn undertook investigations, the result of which he summarises as follows:—Blackleg filtrate is an effective immunising agent against blackleg. It confers an active immunity which protects cattle for as long a period as the germ-free extracts (aggressins) prepared from the juices of the tissues from affected cattle. Since it does not contain the blackleg germ in any form it cannot produce the disease, therefore losses incidental to vaccination with the powder or pellet form are entirely avoided. Blackleg filtrate may be prepared in a concentrated form, and, when suitably preserved, will retain its potency for an almost indefinite period of time. It is essential to subject the filtrate to the various tests for sterility, both during the filtration and the filling processes, in order to guard against any possible contamination.

THE INFLUENCE OF SUBCUTANEOUS MALLEINATION ON CONGLUTINATION
(Der Einfluss der subkutanen Malleinimpfung auf den Ausfall
der Konglutation). C. SCHAFFTER. *Schweizer Arch. f.
Tierheilk.* Vol. LIX., No. 6. June 1917. Pp. 313-335.

The author practised the subcutaneous injection of undiluted mallein from the Pasteur Institute at Paris on sixteen sound horses. Different doses were given, varying from 1 c.c. to 0·005 c.c. Systematic examination showed that there was a brisk production of antibodies demonstrable by the conglutination test. The size of the dose of mallein injected had only a limited effect upon the amount of the antibodies. In fifteen of the experimental animals the antibodies made their appearance between the third and the eighth day, and disappeared between the twentieth and the fifty-seventh day.

The results of Schaffter's investigation are in part opposed to what Pfeiler and Weber and Kranich are reported to have found. According to the present research, conglutination has the same diagnostic significance for cases of fresh infection as have agglutination and complement-fixation. In other respects Schaffter's results are markedly at variance with those obtained by other investigators.

THE INTRAPALPEBRAL REACTION IN EXPERIMENTAL TUBERCULOSIS OF
THE HORSE AND IN BOVINE TUBERCULOSIS (L'intrapalpebro
reazione alla tubercolina nella tubercolosi sperimentale del cavallo
e nella tubercolosi dei bovini). P. CREMONA. *Il Nuovo Ercolani.*
Vol. XXII, No. 12. 30th June 1917. Pp. 189-194. 1 Figure.

The author infected a healthy horse with the bovine tubercle bacillus, and, a month afterwards, applied the intrapalpebral test. At the end of six hours there was a marked oedema of the eyelids, with closure of the eye, muco-purulent discharge from the conjunctiva, exaggerated sensitiveness, and an increase in temperature. After twenty-four hours the oedematous swelling extended considerably beyond the zygomatic crest, and there was an elevation of temperature of 2·8°. All the manifestations of reaction were present on the fifth day, and the regressive phase lasted ten days.

The author asks why evidences of reaction are so much more marked in the horse as compared with those in bovines, and seems to think that it may be because the eyelid of the ox is more compact, has more connective and less areolar tissue, possibly possesses less vascularity, and is less rich in lymphatics.

SURGERY.

THE TREATMENT OF "QUITTOR" (Le traitement de la nécrose du fibro-cartilage latéral—javart cartilagineux). J. HAMOIR. *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 301. 15th January 1917. Pp. 2-24. 8 Figures. (Sur le traitement du javart cartilagineux sur le front.) R. MOUSSU. *Rec. Méd. Vét.* Vol. XCII., Nos. 3-4. *Bull. Soc. Centr. Méd. Vét.* 18th January 1917. Pp. 72-74. (Nouveau manuel opératoire du javart cartilagineux.) FLEURET. *Rec. Méd. Vét.* Vol. XCIII., No. 13. 15th July 1917. Pp. 338-343. 5 Figures. (Du traitement du javart cartilagineux par l'amincissement du bourrelet et de la paroi et le passage dans la fistule d'une mèche imprégnée de vésicatoire.) HAAS. *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 272-274.

Hamoir makes a critical survey of Perrier's (see this *Review*, Vol. I. p. 153) and other methods, and incidentally records his own observations and experiences. Two years of uninterrupted surgical practice in a military hospital have considerably modified his views as to the necessity or advisability of removing the cartilage. The two principal methods of treatment are—(1) The employment of caustics and escharotics to get rid of the necrotic area or areas on which suppuration and fistulous formation depend. (2) The radical or surgical method, which consists in the total ablation of the fibro-cartilage. These operative procedures are compared, and their advantages and disadvantages are discussed, at some length. The surgeon has at his disposal four different means of access—

1. The wall at the quarter: classic operation.
2. The wall and coronary skin: Bayer's and Schröder's methods.
3. The plantar surface of heel and sole: Chuchu's method.
4. The coronary skin: Perrier's method.

Classic Operation.—This is still the most popular, in spite of its drawbacks, chief amongst which, according to the author, is the interference with the integrity of the wall, thus prolonging the period of incapacity for active work. It is also practically subcutaneous, performed through a narrow opening which makes the dissection of the cartilage a somewhat difficult and laborious procedure. Most difficulty is experienced in connection with the antero-superior angle, the removal of which exposes the operator to the risk of opening the articular *cul-de-sac*. This accident, by the way, is not necessarily fatal, provided asepsis can be maintained. In order to minimise this risk, the instruments of Buss are recommended in place of the old-fashioned sage knives. The latter are sharp instruments which may slip, whereas the

former are blunt-pointed cartilage knives and curettes, of various sizes and shapes, which remove the cartilage in successive slices.

Bayer's and Schröder's Operations.—Both permit the quick and easy removal of the entire cartilage through a large open wound. After stripping the wall, as in the classic procedure, a U-shaped incision is made with the convexity lowermost (Bayer), or with the convexity situated posteriorly (Schröder) (see Figs. 1 and 2). The U-shaped piece includes the skin, coronary cushion, and a portion of the sensitive laminæ. Bayer incises the coronary cushion transversely in two places—at the anterior part of the quarter, and a little in front of the heel; he then raises the flap in an upward direction. Schröder, on the other hand, incises the coronary cushion at the heel only, after which the flap is pulled forwards. Both operators, after dissection of the cartilage, replace the U-shaped flap and secure it in position by means of interrupted sutures. Unfavourable sequelæ are—Gangrene of the strip of

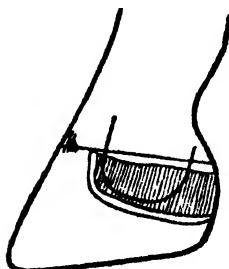


FIG. 1.—Bayer's Operation.

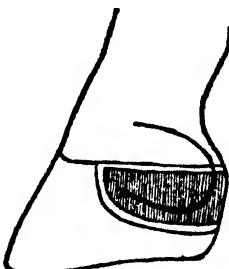


FIG. 2.—Schröder's Operation.

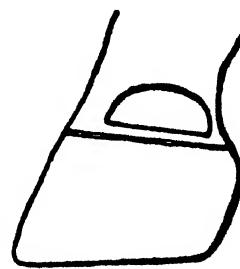


FIG. 3.—Perrier's Operation.

tissue, suppuration interfering with the healing of the coronary cushion, interference with the growth of horn (false quarter), and lameness. The dangers to which the coronary cushion is exposed outweigh the advantages of these methods, especially Bayer's.

Chuchu's Operation.—Access is obtained to the posterior portion of the cartilage under the wall at the heel. The sole and heel are pared and partly removed, the cartilage is sliced away with a narrow-necked shoeing-knife; but the whole of the wall is preserved intact, thus enabling the horse to return to work more quickly. Necrosis of the cartilage arising from a suppurating corn or a nail penetrating towards the heel may be dealt with in this way. There is the further advantage of a large dependent opening for drainage. A great objection, however, is the risk inseparable from a more or less partial operation. The necrotic process, it is well known, often extends in a forward direction, even in the most favourable cases, e.g. a single fistula connected with a small core lying free in a cavity which is shut off by granulation tissue.

from the surrounding healthy cartilage. When operation is indicated, the general opinion is against conservative surgery, and in favour of total ablation of the cartilage.

Perrier's operation also preserves the wall (Fig. 3). Proper drainage is, however, quite impossible; the wound opens at the top, and is admirably disposed to favour the retention of discharges. If suppuration takes place, the lateral ligament is seriously exposed to maceration, whilst fatal results follow the accidental opening of the *cul-de-sac*. Again, the sacrifice of a large piece of skin, in order to include the fistulous openings, is unjustifiable, since the fistulae, lightly curetted or cauterised, soon heal once the source of the suppuration has been removed. Lastly, the operation is by no means an open one; the lower portion, particularly the extremities, of the cartilage may easily be overlooked.

Operative Sequelæ.—According to the author, complete, as well as partial, ablation is followed by regeneration of the fibro-cartilage at a more or less rapid rate. Ossification of the reformed cartilage also frequently occurs, accompanied or followed by a rarefying ostitis of the third phalanx, and even of the navicular bone. In this way, obstinate lameness may arise after the quittor has been cured; injections of cocaine or neurectomy may diminish but do not remove the lameness. Nevertheless it may abate and disappear in time when the lesions arrive at a quiescent stage.

Employment of Caustics and Escharotics.—The old simple method of treatment by cauterisation has been deservedly popular in the past; and, owing to their numerous successes, certain caustic agents have been considered specific remedies. The author discusses the reasons why they have been largely supplanted by the modern method of operation. He himself, up to the end of 1915, operated on every case of quittor. Since that time he has obtained excellent results with the actual cautery and Villate's solution. Technique as follows:—With a grooved director determine the direction and depth of the sinus or sinuses. Insert a blunt-pointed red-hot iron to the bottom two or three times. On the following and succeeding days inject a glass syringeful of Villate into each opening, taking care to wrap the nozzle of the syringe to increase the pressure. The purulent discharge immediately increases in amount, and after some days it contains particles of necrotic tissue and debris. The lameness is only slightly increased. After a short time the suppuration decreases, the pus becomes inspissated round the sinous openings and on the wall; the openings contract, and in two or three weeks the discharge ceases. This is followed in eight days by cicatrisation of the sinuses. It is claimed that this result is obtained even in apparently serious cases, and that a second cauterisation in refractory

cases is seldom required. The treatment is essentially conservative; it is also curative, and is less likely to be followed by unfavourable sequelæ than the classic operation. The average duration of the treatment is also very short.

Clinical Cases.—Twenty-eight cases are recorded, fourteen mild, twelve serious, and two complicated. In the first two classes, twenty-six in all, only five relapses occurred, all of which responded satisfactorily to a resumption of the treatment. Of the two complicated cases, one, a saddle-mare, had previously been un-nerved (double plantar), and was subsequently destroyed for suppurative arthritis. The other also suffered from advanced canker affecting the same foot. Owing to the failure of the hot iron and Villate's solution in regard to the quittor the classic operation was performed. Partial recovery followed a long course of treatment for the dual affection. The case is interesting in that it is the only one in which the author has been obliged to resort to extirpation of the cartilage since 1915. He claims that a major surgical operation is unnecessary in the great majority of quittors, which readily yield to the simple and quicker method described above.

Moussu says that "quittor" is one of the commonest and most serious accidents affecting horses at the front. More than three-fourths of the cases are due to the action of mud, to which animals are constantly exposed in cold wet weather, and from which it is impossible to protect them. Necrosis of the cartilage is secondary to extensive gangrene of the skin and subjacent tissues. As a rule, the classic operation can only be performed in a base hospital where the subsequent dressings can be properly carried out. Nevertheless, in various comparatively simple cases, the horse may be kept at work, and a cure obtained by means of simple inexpensive treatment. The author's procedure is a variation of the old method, which consists in the injection of Villate's solution and the insertion of drains. *Technique:* The whole of the wall covering the cartilage is well thinned. A blunt seton-needle is inserted to the bottom of the fistula, causing a slight prominence of the thinned wall over which a counter-opening is made. The counter-opening is only possible in cases where the fistula is connected with the outer surface of the cartilage. The fistulous tracts are then mechanically cleansed with boiled tepid water, and injected with a 1:2000 solution of corrosive sublimate in glycerin. Glycerin is chosen on account of its affinity for water and its penetrating properties. About 10 c.c. of the sublimated glycerin are injected twice daily, the fistulous orifices being immediately closed with pledgets of cotton-wool to prevent the access of dirt. In two cases in which a counter-opening was made the duration of the treatment was seventeen and nineteen days respectively; in two others without a counter-opening twenty-six and thirty-one days were required to complete the cure.

Fleuret excises the whole cartilage, as in the classic operation, but obtains access to it by *the complete removal of the coronary cushion* over the operative area. After thinning the upper part of the wall close to the coronet, a portion of skin, including the sinuous opening, over the upper part of the cartilage is dissected away, taking care to sacrifice as little skin as possible. After removal of the subcutaneous tissue a second incision is made with the sage-knife under the coronary cushion to enable its resection to be carried out, thus exposing the cartilage. The cartilage is removed in the usual way. The upper part of the wall is now divided, together with the underlying tissues, in order to curette the upper border of the third phalanx, and, at the same time, to avoid a pocket. If a sidebone exists, it is detached from the pedal bone by means of a sharp instrument; the sage-knife, introduced parallel to the sidebone, being employed to divide the soft tissues and complete the operation. Large sidebones, uncomplicated with quittor, are excised with less risk of injury to the synovial membrane and the ligaments. The first dressing is left *in situ* for a week, the second for a fortnight, by which time the wound cavity is filled with granulation tissue. The new coronary matrix, which seems to be formed by a special growth of the podophyllous tissue (*sensitive laminae*), fills the place occupied by the resected matrix, the new matrix leaving in its course a horny tract which unites with the wall without any solution of continuity.

Advantages.—It is claimed that the coronary matrix may be resected with impunity, completely exposing the cartilage, and converting the quittor into a shallow open wound. Operation simple, occupying fifteen to twenty minutes. No deformity of hoof owing to preservation of wall.

Haas practises the old method of plugging the sinus with a tent of tow or double strands of thread soaked in a vesicant. The wall is thinned to a pellicle, the probe deeply inserted into the sinus, and the podophyllous tissue is incised an inch or rather more below the coronary cushion. With the sage-knife introduced into this incision, both these matrices are separated over and beyond the area of the sinus; the latter is then thoroughly curetted, the core being frequently extracted during the process. The coronary band may be raised by means of hooks. The tent is now inserted (one tent for each sinus if multiple) from below upwards, renewed on the third day, the new tent being allowed to remain for ten to fifteen days whilst suppuration is taking place. After removal injections of Villate's solution or tincture of iodine are employed. Sometimes a gangrenous zone surrounds the sinus, necessitating a bold, circular, deep incision which avoids the coronary band.

Advantages.—Easy technique; no false quarters; cure in three to four weeks.

(A. W.)

THE TREATMENT OF CONVEX SOLE (Om botandet av fullhov). A. PALMAN.
Svensk Veterinaertidsskr. Vol. XXII., No. 5. May 1917. Pp. 165-175. 9 Plates.

The author does not follow the lead of some writers and differentiate between flat sole and convex sole, as he considers that the latter certainly arises from the same conditions as the former. The only difference is one of degree. Most veterinary surgeons and horsemen in Sweden deny the possibility of restoring the foot to its normal state, and treatment is generally considered satisfactory if, by means of suitable shoeing, the horse can be kept at work at a slow pace and on soft ground. Leisering and Hartmann (*Der Fuss des Pferdes*, 1861), however, expressed a somewhat different view, but only in regard to the milder cases of flat sole.

Though some writers have observed that in flat and convex sole the heels are low, and have proposed that they be raised, this is only suggested for those mild cases of flat sole in which an open shoe can still be used. In severer cases, where a round shoe is called for, elevation of the heels seems to have been regarded as unimportant. No writer seems to have noticed that in severe cases the pastern-joint is straighter than normal.

The primary cause of the condition, according to Palman, is lowness of the heels, whereby weight on the hinder part of the hoof is greatly increased. In order to lessen the weight on the heels and relieve the tension on the deep flexor tendon the pastern-joint is straightened. The abnormality begins at the hinder part of the foot, but, unless suitable shoeing is adopted, will extend forwards.

The author has observed and treated a large number of cases, and adopts the method of shoeing with a round shoe combined with elevation of the heels. He instances a severe case in which this treatment was adopted, with the additional elevation of the heels by wedges of leather, with the most satisfactory results. The convexity and protuberance of the sole disappeared, the heels grew in height, and the pastern-joint, which was nearly straight, recovered its natural condition. He therefore asserts that, notwithstanding statements to the contrary, convex sole can be cured if proper regard is had to its nature and mode of development.

(F. K.)

THE ANTISEPTIC PROPERTIES OF ACRIFLAVINE AND PROFLAVINE, AND
BRILLIANT GREEN. C. H. BROWNING, R. GULBEANSEN, and
L. H. D. THORNTON. *Brit. Med. Journ.* No. 2951. 21st July
1917. Pp. 70-75. 2 Tables, 2 Graphs.

NOTES ON THE USE OF FLAVINE AS AN ANTISEPTIC. V. C. JAMES.
Journ. Roy. Army Med. Corps. Vol. XXVIII, No. 3. March
1917. Pp. 392-395.

ACRIFLAVINE PASTE AS A DRESSING FOR INFECTED WOUNDS. C. J. BOND.
Brit. Med. Journ. No. 2949. 7th July 1917. Pp. 6-7.

THE PHYSIOLOGICAL AND ANTISEPTIC ACTION OF FLAVINE. A. FLEMING.
Lancet. Vol. CXCIII., No. 4905. 1st September 1917. Pp. 341-345. 2 Figures, 4 Tables.

Browning, Gulbransen, and Thornton have directed additional attention to the antiseptic properties of the various "flavine" compounds, and state important facts in this fresh report to the Medical Research Committee. (For an abstract of an earlier paper, see this *Review*, Vol. I. p. 157.)

One of the points elicited is that flavine compounds and brilliant green are antiseptics which exert a slowly progressive bactericidal action, and that, in concentrations which at first inhibit the growth and finally kill bacteria, they have no harmful effect on phagocytosis or on the tissues locally or generally. Their application to the peritoneum is attended with no danger.

Unlike other antiseptics, flavine compounds (acriflavine and pro-flavine) have their bactericidal potency enhanced by serum. Brilliant green, on the contrary, is like other antiseptics in that its bactericidal power is reduced by serum. This means that in using flavine compounds it should be so arranged that these substances shall act in a serum medium, and that accumulative deposit should be prevented by avoiding too frequent additions of considerable quantities of the antiseptic solution. The clinical evidence at the disposal of the authors points to the application of flavine bodies by means of gauze packings or some appropriate modification of this procedure as likely to yield the best results. It is evident that a relatively simple technique may be followed in their application.

The application of the flavine compounds, especially for the purpose of preventing the onset of septic manifestations in early wounds, is emphasised. Operative measures are an essential preliminary to the effective use of therapeutic antiseptics in wounds, since the antiseptic can act only when brought into intimate contact with infected tissues.

Though brilliant green is largely inactivated by serum, it nevertheless satisfies the requirements for application by repeated irrigation (Carrel's method), as a powerfully bactericidal solution (1:2000) in water is practically innocuous to the tissues.

Lieutenant James relates experience of the use of flavine on wounds mostly acquired on service. The wounds varied from slight to severe, but in all cases a definite infection accompanied by suppuration was present. Though the antiseptic has only been used on a modified scale up to the present, the observations have been sufficiently promising to hold out hopes of great improvement in wound treatment in the future.

The wounds were thoroughly cleansed with either normal saline or a mixture of equal parts of normal saline and hydrogen peroxide solution. In this way exudate, pus, and slough have been removed as far as possible. After this the wound was swabbed out with 1:1000-flavine, a few c.c. of the antiseptic being left in the wound to absorb. The wound was then covered with gauze soaked in flavine solution, and the whole covered with waterproof protective.

In some cases where the pus had been discharged abundantly for weeks, the discharge was greatly diminished within forty-eight hours. The granulations which appear in the flavine treatment are small, pink, firm, and do not bleed readily.

It has also been observed that in wounds treated with flavine the epidermis tends to grow over the granulating surface with remarkable rapidity. The writer considers that this affords a valuable demonstration of the non-irritant and non-toxic properties of flavine.

Bond gives the following details respecting the preparation of acriflavine paste:—

"Acriflavine soap paste is made by neutralising stearic acid with sodium carbonate in the proportion of 1 part of sodium carbonate to 1½ part of stearic acid, with the addition of 0·1 per cent. of acriflavine. The soapy compound so prepared is canary yellow in colour and firm in consistence.

"Acriflavine gelatin is made by heating French gelatin in water with the addition of 0·1 per cent. of acriflavine. The consistence of the jelly is determined by the amount of water added.

"Acriflavine starch mucilage is made by adding boiling water to starch, with the addition of 0·1 per cent. of acriflavine; 1 part of starch to 10 of water forms, when cold, a thick mucilage. This form of dressing has been found useful for large granulating surfaces."

It is necessary that the wound should be first surgically cleansed, and if highly infected may be dried and swabbed out with acriflavine spirit or water solution and then packed with acriflavine paste.

Fleming states the results of some experiments he has made with flavine, and contends that the claims that this substance approaches the ideal antiseptic are based on fallacious experiments, and that by altering the experimental conditions slightly the "therapeutic coefficient" can be altered to a great extent. His experiments show that the action of flavine on living tissues (as exemplified by leucocytes) is in excess of its lethal action on bacteria. It has a very destructive action on leucocytes, and in a concentration of 1:2000 completely inhibits leucocytic emigration. When many microbes are used it requires a much greater concentration of flavine to effect sterilisation than that given as the "lethal concentration" by Browning and his co-workers.

In serum under certain conditions staphylococci will grow in 1:32,000 flavine, *B. coli* in 1:100, and *B. proteus* in 1:2000. Flavine 1:8000 appears to aid the growth of *B. proteus*. "If the antiseptic is allowed to act on staphylococci and leucocytes alike for twenty-four hours and the ratio is taken of its toxicity to both of these, carbolic acid has a coefficient ten times better than flavine when the antiseptic acts on the microbes in serum, and 250 times better when the bactericidal action is estimated in pus."

THE CAUSE OF FRACTURE OF THE BASE OF THE SKULL IN SOLIPEDS
(Considerazione sulla genesi di alcune fratture della base del cranio nei solipedi). A. FERLINI. *Il Moderno Zootiatro. Parte Sci. Ser. V., Vol. VI., No. 3.* 31st March 1917. Pp. 53-60.
4 Figures.

The real reason of fracture of the base of the skull as the result of indirect violence has exercised many observers. Lanzillotti (*Tratto di patologia e terapia chirurgica generale e speciale degli animali domestici*, Milan, 1873, vol. ii.) affirmed that violence to the neck is as if applied immediately to the base of the skull. Vachetta (*La chirurgia speciale degli animali domestici*, Pisa, 1900, vol. ii.) enunciated a double theory—that of ascending and descending reaction, and that of vibration. Bernardini (*Lesioni traumatiche del cranio e dell' encefalo nei nostri animali domestici*, 1905) practically confirmed the conclusions of Lanzillotti. Ghisleni (*La Clinica Vet.*, 1906, pp. 148 and 721) concluded that it is possible to apply to the lower animals the mechanical theory enunciated for the human subject by Chipault and Braquelhay. Berton (*Bull. Soc. Centr. Méd. Vét.*, 1912, p. 106) suggested that in trauma of the temporal region the zygomatic process is capable of transmitting to the sphenoid, occipital, and temporal bones all the force it receives.

In the present article Ferlini describes a case which he believes throws light on the problem. A twenty-year-old horse, when being cast for an operation, struck the right temporal region with great force on the hard floor, and died immediately. On post-mortem examination minute ecchymoses were found on the inferior surface of the brain, and a subdural haemorrhage was present, most marked over the basilar part of the occipital bone. When the skull had been macerated the sphenoid showed three lines of fracture, of which two involved the right wing and one the right pterygoid process of the bone. A fracture of the occipital bone began about the middle of the right margin of the basilar part of the bone, and passed obliquely backwards, to terminate about 1 cm. from the left condyle. It was observed that the bones of the cranium were very thin and translucent.

Seeing that in this case the shock was received on the prominent

part of the zygomatic arch corresponding to the articular tuber of the squamous temporal bone, it seems feasible that in this and similar cases the force of the impact was transmitted by the root of the zygomatic arch to the sphenoid and occipital bones.

ABDOMINAL HERNIAS. C. A. CARY. *Journ. Amer. Vet. Med. Assoc.*
Vol. L, No. 7. March 1917. Pp. 823-830.

The author discusses the etiology and clinical conditions of hernia, confining himself mainly to ventral and umbilical hernia in large animals, and the operations for their radical cure by suturing the hernial ring. The prognosis depends upon (a) The age—natural recovery often taking place in young animals, which are also the most favourable subjects for operation. (b) The condition—wounds in lean animals healing more quickly. (c) The size of sac and ring—small sacs and small rings being more easily dealt with. (d) The shape of the ring—large, wide, or circular apertures being difficult to close. Proper closure is often impossible in the case of ragged irregular rings, which are fortunately rare. (e) The location of the ring—the anterior portion of the abdomen being more favourable in males on account of its accessibility for bandages and dressings, and its freedom from soiling by urine. Treatment may be expectant in very young animals. For small herniae, ligatures, pressure bandaging, irritants, and other more or less palliative methods may be employed. But for ventral and umbilical herniae in which the aperture is small or long and narrow, and favourably situated, the ordinary suture method is recommended in order to effect a radical cure in a short time. *Operation:* Thoroughly prepare the animal, empty the alimentary canal without purgatives, cast or place on an operating-table, give a general anaesthetic, and secure in a suitable position with the hind-quarters raised. As a rule, make an incision parallel to the long axis of the hernia, and free the skin and sac right down to the ring. Carefully open the fundus of the sac, break down adhesions, if present, and return the contents into the abdomen, retaining them there by pressing on a pad of sterile gauze. Now examine the ring. If small, narrow, and easily closed, two methods are open to the operator—either return the sac into the abdomen, and pass the sutures over it through each border of the ring; or cut away the entire sac, thus exposing the hernial ring; scarify the edges of the latter, and insert strong deep silk interrupted sutures 12 to 18 mm. apart. Each stitch passes through all the coats of the abdominal wall except the skin. Place all the stitches before tying, and begin tying at the ends, finishing in the centre. When the ring is 3 ins. or more in breadth, leave $\frac{1}{2}$ to 1 in. of sac on each side of the aperture from the centre towards each end. At the ends, little if any sac need

be left. Suture as before, thus bringing the raw edges of remnant sac into close apposition. The author does not use mattress or quilled sutures, being of opinion that they are difficult to keep aseptic or clean. If the hernial ring is very large, the freed sac is laid open from end to end of the aperture, each half of the sac remaining attached to its own side. "Each half of sac is now cut so as to nearly reach the opposite side of the ring. One half is first stitched to the opposite border of the ring with large fourteen-day catgut, or large braided silk, by passing the needle through the abdominal wall one half-inch from the ring on the opposite side, then through the cut border of the sac from the other side, and then out through the base of the sac near the ring." As before, all the stitches may be inserted before tying. The other half of the sac is now stitched in a similar manner. The sides of the aperture are thus approximated, and any opening which remains is filled by the tough fibrous sac. Next, stitch up the skin without removing any portion of it, and apply a large pad kept in position by a broad many-tailed bandage. After the animal rises, apply a second bandage over the first. Subsequently, dress the wound twice daily for the first three or four days, then once a day. Remove one or several sutures, as required; remove blood-clots. Suppurating silk sutures must be withdrawn; others which do not suppurate may be left *in situ*. Lastly, avoid bulky food, and prevent the animal lying down.

It is claimed for this method of operating that the repair or scar tissue is stronger and less liable to break down than any other part of the abdominal wall.

(A. W.)

THE WILLIAMS OPERATION FOR "ROARING" (Note sur l'opération de Williams). CH. GUYON. *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 304. 15th April 1917. Pp. 129-136. 1 Table.

The experience of the writer leads him to conclude that the Williams operation for "roaring" merits a special place in veterinary surgery, even though it does not always produce the marvellous results some authors have claimed for it. In forty operations Guyon has had six cures, twenty-two obvious ameliorations of symptoms, nine cases in which there was no amelioration, and three deaths. He considers, therefore, that the operation gives an average of about 60 to 65 per cent. of successes. The operation is, however, only of real value from an economic point of view in those cases where the "roaring" is pronounced.

Guyon conducts the operation under chloroform anaesthesia, which, contrary to the opinion expressed by some operators, he considers absolutely without danger. He now always uses Pecus' extractor, which, he thinks, merits all that the inventor has claimed for it.

The classic theory regarding the frequency of paralysis of the left arytenoid, as compared with that of the right, is fully confirmed by the Williams operation.

The intensity of the "roaring" is not always relative to the degree of paralysis of the arytenoid. Some horses, feeble or only moderate "roarers," have presented complete paralysis of the left arytenoid along with paresis of the right cartilage, while loud "roarers" have only shown paralysis of the left arytenoid.

TREATMENT OF SORES OF THE BACK (Traitement des plaies du dos).

BODIN. *Rev. Gén. Méd. Vét.* Vol. XXVI, No. 304. 15th April 1917. Pp. 136-137.

The writer describes a method of treatment of sores for which he claims extreme simplicity and efficacy. The wound is first cleansed with physiological serum, and then completely covered by a piece of aseptic amnion. By the next day the membrane is dry and like parchment. It adheres closely to the wound, which, excluded from the air, heals without further intervention.

The amnion of the calf may easily be obtained if one happens to be located near an abattoir. But under other circumstances it may be preserved in Raulin's fluid, of which the following is the formula:—

Water	1500	c.c.
Sugar candy	70	grammes.
Tartaric acid	4	"
Nitrate of ammonium	4	"
Phosphate of ammonium	0·60	gramme.
Carbonate of potassium	0·60	"
Carbonate of magnesium	0·40	"
Sulphate of ammonium	0·25	"
Sulphate of zinc	0·07	"
Sulphate of iron	0·07	"
Silicate of potassium	0·07	"

TWO CASES OF RESECTION OF THE BODY OF THE MANDIBLE (Due casi di resezione del corpo del mascellare). F. MARCO. *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI, No. 4. 30th April 1917. Pp. 105-107.

Marco recalls that resection of the body (incisive part) of the mandible has been practised with a certain amount of frequency and success. The first reported instance of the operation appears to be that performed by Bouley (*Rec. Méd. Vét.*, 1838, p. 624) in the Alfort

clinique. The second operation was performed by Keller. Sozzo (*Giornale Med. Vet.*, 1862, p. 154) made a resection on a level with the symphysis; Schleg removed the body of the mandible of a dog; MacGillivray in 1870 performed the operation in a seven-days' calf: in 1862 Basarjaninow performed the operation with success; Lanzilloti (*Tratto di Tecnica e Terapeutica chirurgica*) is said to have operated several times on healthy horses and always with success.

Marco now records two operations. The first was in a mule in which there was a comminuted fracture of the mandible and laceration of the tongue as the result of injury produced by firearms. Mastication was hampered, and even fluids were taken with some degree of difficulty. It was, therefore, determined to operate. The lacerated part of the tongue was first amputated, and then a portion of the mandible was resected after freeing the soft tissues and the periosteum. A month after the operation the patient was put on normal food. Finally, the only evidence was a slight atrophy of the lower lip.

The second case was that of a mare with fracture of the mandible. An operation similar to that described in the mule was performed, and in a couple of months the animal was returned to regular service.

TERATOLOGY.

ANOMALY OF THE RIGHT NASO-LACHRYMAL DUCT IN A HORSE (Curieuse anomalie du canal lacrymal droit chez un cheval. Contribution à l'étude des fistules lacrymales). MARCENAC. *Rec. Méd. Vét.* Vol. XCIII., Nos. 7-8. 15th April-15th May 1917. Pp. 199-202.

In a seven-year-old army horse it was found that tears collected, drop by drop, at an opening situated about 3 cm. below the inner angle of the eye. From this point they flowed towards the nose, not along a tract denuded of hair, such as is usually produced by obstruction of the naso-lachrymal duct, but along a groove rendered very apparent by discoloured hairs. A second opening was present about 2·5 cm. below the inferior margin of the nostril.

On exploration of the upper opening it was found to lead upwards into a canal, large enough to admit a pencil, which communicated with the eye. A very fine, capillary, subcutaneous canal passed downwards from the upper opening towards the wing of the nostril.

Exploration of the lower opening was impossible by the means at the disposal of the writer.

In brief, a subcutaneous naso-lachrymal duct possessed two openings on the face; the openings being united by a narrow tube which permitted

of the passage of a small quantity of tears sufficient to keep the lower opening just moist. The greater part of the tears flowed on to the face from the upper opening.

In the absence of a history of the case it was impossible to determine whether the condition was congenital or acquired.

TOXICOLOGY.

POISONING OF CATTLE WITH BRITISH RAGWORT. Sir STEWART STOCKMAN. *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. Pp. 131-134.

Although poisoning with various species of ragwort is well known in South Africa, certain parts of Canada, New Zealand, and Australia, there are apparently no recorded cases of death from eating the British ragwort (*Senecio jacobaea*). This may possibly be due to the fact that the poisonous principle is cumulative in its effects, and animals will not show symptoms until a considerable quantity of the weed has been consumed, or even until some time after feeding on ragwort has been discontinued. In the poisoning now recorded sixteen animals were affected out of a herd of twenty-four cattle. "Some of the animals which died did not begin to show signs of illness for some time—up to three weeks—after feeding on ragwort had been discontinued, and it would appear that, even after a toxic amount of the material has been consumed, a certain amount of time is necessary to produce the action which gives rise to the visible symptoms."

The symptoms were those of nervous derangement, sometimes amounting to frenzy. The lungs were congested. There was muco-enteritis with small haemorrhages under the mucous membrane, serous effusion into the omentum, small haemorrhages in the pericardium, and enlargement and fine cirrhosis of the liver.

ACUTE MERCURY POISONING. A PARALLEL HISTOLOGICAL AND CHEMICAL STUDY OF THE RENAL AND HEPATIC TISSUE CHANGES AS COMPARED WITH THE RAPIDITY OF ABSORPTION AND THE AMOUNT OF MERCURY PRESENT IN THE CIRCULATING BLOOD AT THE TIME SUCH CHANGES OCCUR. W. H. BURMEISTER and W. D. McNALLY. *Journ. Med. Res.* Vol. XXXVI, No. 1. March 1917. Pp. 87-98, 1 Chart.

In this paper are given the results of the examination of the kidneys, liver, and large intestine of fourteen dogs poisoned by mercuric chloride.

The authors found that mercury can be detected chemically in the blood of poisoned animals within a few minutes of the administration of mercuric chloride. Degenerative changes, leading to cell death, take place rapidly in the kidney, and occur simultaneously with the appearance of mercury in the circulating blood. With large doses, immediate renal changes vary with the size of the dose of the poison. Changes in the liver vary with the duration of the intoxication. Smaller doses produce renal changes dependent on the duration of the intoxication. Consequently, the renal and hepatic changes are not always commensurate. In one dog, where the renal changes were least severe, the hepatic degeneration was most marked.

The degree of renal and hepatic degeneration does not necessarily vary with the amount of mercury in the circulating blood.

PRELIMINARY REPORT ON THE RELATION OF ANAEROBIC ORGANISMS TO
FORAGE POISONING. By J. S. BUCKLEY and L. P. SHIPPEN. *Journ.
Amer. Vet. Med. Assoc.* Vol. L, No. 7. March 1917. Pp. 809-816.

Forage poisoning or cerebro-spinal meningitis of horses may have different etiological agents. Pearson has shown its likeness to meat poisoning. The authors had for some time decided to hunt for an aerobic organism which would produce powerful toxins.

From good material obtained in 1915 an effort in this direction was negative. Shippen suggested that the disease closely resembled botulism or sausage poisoning of man. Accordingly experimental work was conducted with *B. botulinus*. Two strains were available, but only one of them was pathogenic to laboratory animals. This strain had been isolated from cheese by Dr. Nevins—eating the cheese had caused the death of several people. Shippen proved its toxicity to small experimental animals, and showed that it corresponded in details with van Ermengem's bacillus.

Cultures of *B. botulinus* proved toxic to donkeys. Shippen concludes that there are sufficient differences between *B. botulinus* of Nevins and that of van Ermengem to suppose that they are distinct varieties. Forage poisoning may be caused by a toxin similar to that produced by *B. botulinus*, or some cases even may be due to particular strains of *B. botulinus*.
(R. G. L.)

STUDIES IN FORAGE POISONING—4. R. GRAHAM and L. R. HIMMELBERGER. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 2. May 1917. Pp. 164-187. 6 Plates (18 Figures), 5 Tables.

The authors here give a report of their further investigations into forage poisoning. An oat hay was proved to be poisonous to horses

and mules. Several micro-organisms were isolated from the forage and a spore-forming, Gram-negative, aerobic bacillus was found to be pathogenic when administered to horses and mules, but less so for cattle, sheep, and goats. Guinea-pigs, rabbits, and mice were apparently immune. The clinical symptoms of the experimental animals were very similar to those of horses which followed the eating of the oat hay.

This paper contains much important detail, and should be read in the original by those interested. (R. G. L.)

EUPATORIUM AGERATOIDES, THE CAUSE OF TREMBLES. R. S. CURTIS and F. A. WOLF. *Journ. Agric. Res.* Vol. IX., No. 11. 11th June 1917. Pp. 327-404. 3 Plates, 5 Figures.

A disease known as "trembles" causes considerable annual loss among the domestic animals in the mountainous sections of North Carolina. A large number of papers dealing with the disease have been published, but the precise cause remained in doubt, as did also the possible transmissibility of the disease to man through the ingestion of milk, etc., of affected animals.

The name has been given to the disease because trembling ataxia and slight, intermittent, tetanic contractions of the muscles of the limbs are the most conspicuous symptoms.

Curtis and Wolf have conducted experiments in which they have fed sheep on green *E. ageratoides*, or "white snakeroot," during the months of June, July, August, September, and October. Fifteen cases of trembles were developed, of which fourteen ended fatally. It is possible, however, that the death of one of these sheep may have been partly due to an infestation of stomach worms. Death resulted in from five to twenty-seven days from the time when feeding on *E. ageratoides* was begun. There was considerable variation in the several cases, as well as in the amount of weed ingested before symptoms of poisoning became manifest.

It was found impossible to communicate "trembles" from sheep typically affected to healthy sheep when they were confined and fed together in a small lot.

Moseley has already suspected that the symptoms were due to poisoning with *E. ageratoides* (*Ohio Nat.*, vol. vi. pp. 463-470 and pp. 477-483, 1906; *Med. Rec.*, vol. lxxv. pp. 839-844, 1909; *ibid.*, vol. lxxvii. pp. 619-622, 1910), and has expressed the opinion that aluminium phosphate found in the leaves and stems of the plant is the active toxic principle. In these experiments by Curtis and Wolf no harmful effects followed the feeding for sixty-nine days of aluminium phosphate mixed with grain and supplemented with alfalfa hay.

TUBERCULOSIS.

PRESENCE OF TUBERCLE BACILLI IN THE FÆCES OF CATTLE IN DAIRY HERDS. R. S. WILLIAMS, W. M. SCOTT, T. ROBERTS, and W. A. HOY. *Vet. News.* Vol. XIV., No. 695. 28th April 1917. Pp. 171-173. *Ibid.* No. 696. 5th May 1917. Pp. 180-184. 2 Charts, 1 Table.

The present research is a preliminary to testing the viability of the tubercle bacillus when excreted on pasture land in the faeces of cows. Incidentally it revealed a means whereby milk may become infected with tubercle bacilli from dung.

To test the excretion of bacilli, guinea-pigs were inoculated with an emulsion of the faeces.

In all, samples of the faeces of 179 cows were examined, but for various reasons some of these were excluded from the final results. After such exclusions it was found that virulent tubercle bacilli were present in the faeces of three cows out of 158. It is possible, however, that one of these infecting cows should also be excluded, as she had been operated upon for tuberculous glands in the neck twelve months before the sample of faeces was taken, and was again obviously unwell. If then this animal be also excluded there remain two apparently sound cows whose faeces infected guinea-pigs with tuberculosis from among 157 which were examined.

By other methods it is possible that other cows might have been found to excrete tubercle bacilli in their faeces. Only one sample was taken from any individual animal, and the sample represented only a very small fraction of the total daily excrement. Moreover, only a fraction of the sample taken could be inoculated into guinea-pigs.

TUBERCULOSIS IN CAMELS. F. E. MASON. *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 80-84.

Apparently tuberculosis is very rare in camels living under normal or natural conditions in all countries except Egypt. In Egypt, however, the disease has long been known to be common.

The constancy with which bacilli of the bovine type have been found in tuberculous lesions in camels supports the view that infection is derived from cattle, and there seems to be little doubt that the usual method of infection is by inhalation. Apparently the lungs never escape infection.

Seeing that the camel shows marked resistance to the disease, tuberculosis in these animals generally runs a very chronic but progressive course. Under adverse conditions, however, such as con-

tinuous transport work in the desert, wasting occurs rapidly, until in a few months the animal is reduced to a mere skeleton, with all the symptoms seen in bovines.

Microscopic examination of the lesions shows that giant cells are rare. Otherwise the microscopic structure is that of tuberculous lesions in general. Calcification appears to set in very early. It is frequently the case that much fibrous tissue is found in connection with the older lesions.

For diagnostic purposes the subcutaneous test with ordinary tuberculin may be used.

Mason gives the following figures respecting the variations in the normal temperature he has observed in a large number of healthy camels at rest:—

Extreme variation between early morning and late afternoon, from 35° C. (95° F.) to 38·6° C. (101·6° F.).

At 6 A.M., 35° C. (95° F.) to 37·5° C. (99·6° F.); usual temperature, 36·2° C. (97° F.).

At 6 P.M., 37·4° C. (99·2° F.) to 38·6° C. (101·6° F.).

A temperature over 37·5° C. (99·6° F.) at 9 A.M. is abnormal.

A temperature over 38·7° C. (102° F.) at 6 P.M. is abnormal.

Mason's observations on temperature agree with those previously published by Leese (*Journ. Comp. Path. and Therap.*, 1909).

TUBERCULOUS MASTITIS IN THE COW: ITS PATHOGENESIS, AND MORBID ANATOMY AND HISTOLOGY. Sir JOHN M'FADYEAN. *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 57-77. *Ibid.* Part 2. June 1917. Pp. 139-172. 39 Figures, 2 Plates.

The author discusses the three views respecting the route of infection of the mammary gland, namely, direct infection by way of the milk canals; infection carried by the blood-stream from a pre-existing focus; and infection by way of the lymphatic vessels from some tuberculous lesion in the abdomen—that is, in a direction contrary to that of the normal lymph flow. The theory of infection by the arterial blood-stream is held to be erroneous. Against this theory of embolic infection are certain features of mammary tuberculosis:—

1. The disease, as a rule, begins in one quarter of the udder, and not in all four quarters.
2. In the great majority of cases it is a hind-quarter which is first attacked.
3. The disease generally appears to have begun at the upper part of a quarter.

4. As a rule the lesions do not appear to develop from separate discrete centres in the quarter first attacked.

5. In certain cases, which are by no means rare, the supramammary lymph-glands are found to be visibly tuberculous while the entire udder tissue appears to be normal.

The lymphatic theory, on the contrary, affords a perfectly satisfactory explanation of the whole of these facts.

Infection through the teat canal must be admitted as possible, and indeed probable, but it is rare.

Attention is again called to the common error in supposing that tuberculous mastitis is a nodular disease, and that consequently palpation of a suspected udder should be directed to the detection of firm nodules. The disease is diffuse, and increased solidity and firmness, without the formation of actual tubercles, are the most constant characters of the lesions.

Histologically, the lesions of tuberculous mastitis usually pass through five stages:—

1. The first stage, or stage of cellular infiltration, is marked by the appearance of increasing numbers of free-lying cells in the inter-acinous spaces.

2. The second stage begins when the cellular infiltration is reaching its height, and during it there is a more or less rapid obliteration of the normal histological features. The author calls this the *histolytic stage*.

3. The third or, as the writer proposes to call it, the *symplasma stage* is perhaps the one which is most characteristic of tuberculous lesions. It is marked by the irregular fusion of the cytoplasm of all the cells at the place where the change is occurring. Degenerative changes take place in the nuclei and the cytoplasm often shrinks away from them. The *symplasma* is mainly composed of the bodies of the foreign cells, but persisting epithelial cells of the acini and remains of capillary walls or of connective tissue are incorporated with it.

4. The fourth stage is that of giant-cell formation.

5. The fifth stage begins with actual necrosis, and, if time is allowed, goes on to caseation and calcification.

An elaborate and detailed account of each of these stages is given.

REPORTS.

REPORT OF AN INVESTIGATION INTO THE HYGIENIC QUALITY OF MILK.
Publication No. 10. National Clean Milk Society, 2 Soho Square, W. April 1917. Pp. 18.

The National Clean Milk Society herein report on the bacteriological examination of samples of milk obtained from twenty-seven London dairymen. The number of bacteria per cubic centimetre ranged from 98,000 to 104,300,000, and in every sample *B. coli* was present. In only two samples was the microscopic evidence of the presence of the tubercle bacillus confirmed by inoculation into guinea-pigs. In the other samples there was no evidence of *B. tuberculosis*.

It is illuminating to learn that a sample sold by a London dairyman as "Certified milk in glass bottles, direct from the farm to customer," contained 12,500,000 bacteria per cubic centimetre, and the presence of the tubercle bacillus was confirmed by the guinea-pig test. This requires no comment.

It is not surprising that the report institutes a comparison between the bacterial content of sewage and the milk supplied as food for children. The number of bacteria found in sewage in our large towns, we are told, varies from two to six million per cubic centimetre. In fifteen of the twenty-seven milk samples discussed in this report the bacterial count was over 2,000,000.

A comparison of the milk supply of large towns in the United States with that in this country does not reflect credit upon the home authorities.

In the United States for the past twenty years the milk problem has been attacked by a constantly increasing army of official and unofficial workers, with the result that the dairy industry there is on a different plane from that in England. In the former country milk is usually sold in grades based on its bacterial content, and in some cases also on the conditions prevailing at the farm where it is produced as shown by a score-card record.

[An account of the milk supply of New York State and City is given in this *Review* (Vol. I. p. 123).]

Grading Milk in New York.—On 31st January 1911 the New York City authorities announced their plan for grading the milk supply, providing:—

- (a) Milk for infant feeding;
- (b) Milk for adults to drink; and
- (c) Milk for cooking purposes only.

During that year bacterial examinations of 14,058 samples of raw milk and 6378 samples of Pasteurised were made, of which the percentage, denoting within certain limitations the bacterial content, may be seen in the following table:—

	Raw.	Pasteurised.
	Per cent.	Per cent.
Under 10,000	14·95	43·99
10,000 to 50,000	15·52	31·23
50,000 to 100,000	10·69	10·91
100,000 to 250,000	14·16	7·88
250,000 to 500,000	11·59	2·36
500,000 to 1,000,000	10·87	1·53
1,000,000 to 5,000,000	16·71	1·01
5,000,000 to 10,000,000	3·21	0·17
Over 10,000,000	1·70	0·07
Spoiled	0·55	0·79

If the National Clean Milk Society can awaken the public to a proper appreciation of the importance of a pure milk supply it will have amply justified its existence.

CEYLON ADMINISTRATION REPORTS. REPORT OF THE GOVERNMENT VETERINARY SURGEON (G. W. STURGEON, M.R.C.V.S.) FOR 1916.

The only outbreak of disease in horses was one of influenza in the first half of the year, which caused no loss. The decrease in the number of outbreaks of rinderpest continued throughout 1916; the total number of cases for the year being 856, as against 1493 in the previous year. Foot-and-mouth disease showed a marked decrease. The total number of cases (including Colombo town and quarantine station) was 284 (280 recoveries), as against 2366 cases in the previous year.

Four cases of surra were detected: two died naturally and two were shot. Anthrax is extremely prevalent among goats and sheep imported from India. Out of 76,820 of these animals imported to the quarantine station, Colombo, 1196 died of anthrax.

An outbreak of infectious ophthalmia occurred among the cattle in

the Eastern Province: 64 cases occurred, and all recovered under treatment. The outbreak ended in July.

The outbreak of swine septicaemia reported in 1915 continued into 1916, when it ended in July. A possible carrier of the disease is *Ctenocephalus canis*, which was found infesting sick pigs.

ABRIDGED REPORT OF THE CHIEF VETERINARY SURGEON (J. M. SINCLAIR), SOUTHERN RHODESIA, FOR THE YEAR 1916. 2nd April 1917.

The position respecting African Coast fever shows a marked improvement as compared with the previous year. The disease, however, made its appearance in the Mrewa district, in which it had not at any time existed, and its reappearance in Gwelo district after over ten years' absence therefrom. In neither case has it been possible to trace the source of infection or the means by which the disease was conveyed. The nearest existing centres of infection to the Mrewa outbreak were about 60 miles distant, in Salisbury district; and in the case of the Hunter's Road outbreak the nearest infected area is about 130 miles away. Direct transmission by cattle seems impossible, in view of the control exercised at all infected centres; indirect transmission, as by clothing, blankets, grass, etc., however improbable, is not impossible, nor is the malicious dissemination of infected ticks.

A few fresh centres of contagious abortion were discovered in the Salisbury and Mazoe districts. A few of the infected herds have been inoculated with massive doses of dead bacilli, with results which appear to be favourable, but whether they are due to the treatment or to other factors cannot be stated.

No cases of anthrax, lung sickness, rabies, or glanders occurred during the year. The mortality from horse sickness was one of the lowest on record.

An outbreak of equine influenza occurred in Bulawayo and adjoining districts during September. Fully 90 per cent. of horses, and many mules and donkeys, were affected. A slight mortality occurred among donkeys and mules, but none in horses.

THE WORK OF THE EXPERIMENT STATION AND AGRICULTURAL EXTENSION SERVICE FOR 1916. University of Wisconsin. Bull. No. 275. January 1917. Pp. 92.

This annual report contains a résumé of the experimental work conducted throughout the year. The following abstracts of selected sections are of interest to veterinarians:—

Growth-Promoting Substances Needed in Food.—E. V. McCollum has demonstrated that in addition to proteins, carbohydrates, and mineral matters, other substances—the so-called vitamines—are necessary in a complete ration. There are two such substances—one soluble in fats and oils, and called by McCollum fat-soluble A; and one soluble in water, called water-soluble B. These are necessary for growth and maintenance of grown animals.

Fat-soluble A is found in milk, eggs, dairy produce, and meat; to a less extent in cereal grains, and is lacking in all extracted vegetable fats. Butter substitutes made from vegetable-fats are therefore deficient. Adequate amounts of fat-soluble A are found in alfalfa hay (*medicago sativa*), and probably in other leafy portions of plants; thus herbivora can thrive on vegetarian diet while pigs fed on any combination of grains so far tested do not. Cows suckling calves, when fed rations containing no fat-soluble A, continued to produce milk, which, however, failed to cause growth of the young. Grown animals require a less quantity of fat-soluble A than when growing, so that milking-cows can concentrate a limited available supply into the milk. Water-soluble B substance is necessary for growth and maintenance; it is found in vegetable foods, meat, eggs, and milk, but is absent from starch, refined sugar, plant fats, and polished rice. The properties of water-soluble B were not destroyed by heating in neutral or acid solution, nor by treatment with dilute alkalies at room temperature. The substance was, however, readily destroyed by very dilute alkalies, but not in acid solution, at such high temperatures as 240° to 250° F.

Efficiency of Various Protein Concentrates for Milk Production.—Trials were conducted to determine the efficiency of some protein-rich concentrates—gluten feed, dried distillers' grains, and old-process linseed meal—when added to a basal ration of corn meal, corn stover, and corn silage. For comparison casein and skim-milk powder were also tested. It was found that gluten feed was less efficient than linseed meal, distillers' grains, and either casein or skim-milk powder. Only 45 per cent. of the digestible protein of the ration was used for milk production with gluten feed, and about 60 per cent. with the other concentrates.

Effect of Restricted Rations on Poultry.—During five years experiments have been conducted in which pullets have been fed rations restricted to corn, wheat, oats or barley. Pullets fed on wheat seem able to overcome the toxic effect of the wheat embryo (see this *Review*, Vol. I. p. 368); they had normal growth and produced fertile eggs. Other trials showed the high value of milk for young chicks. The effect of a scanty calcium supply was investigated; lack of calcium did not cause soft-shelled eggs, the hen apparently drawing on her skeleton for

the calcium. Soft-shelled eggs therefore appear to be due to some pathological condition rather than to a lack of calcium in the food. A scanty supply of calcium, however, seems to decrease the egg production. Emphasis is laid on this point, because farmers frequently only feed oyster shells when soft-shelled eggs are laid. A lack of egg production may be due to an insufficient supply of calcium.

Straw for Growing Dairy Heifers.—Trials have previously shown that growing beef-steers can be wintered satisfactorily on good bright straw, corn silage, and a small amount of concentrates. No trials are on record showing whether such rations are suitable for dairy heifers; therefore two lots of heifers were fed to study this question. The results indicate that straw can often be used satisfactorily and economically, fed with silage and protein-rich concentrates, for growing dairy heifers.

Crushed versus Whole Oats for Work Horses.—Experiments were conducted to determine the economy, if any, of crushing oats for work horses, and it was shown that "unless oats can be crushed for considerably less than 10 per cent. of the cost of whole oats, such preparation will not pay even for horses at hard work."

Hog Cholera.—The general development of the disease throughout the State of Wisconsin is on the decline, although in certain sections it has made very serious inroads.

Stallion Enrolment.—The effect of this law has been to retire from service no less than 356 mongrel or scrub stallions, while the grades and scrubs have fallen in number from a total of 1995 in 1907 to 1239 in 1916.

(R. G. L.)

REVIEWS.

THE BIOLOGY OF TWINS. By H. H. NEWMAN. (University of Chicago Science Series.) Cambridge: The University Press. 1917. Pp. ix. + 186. 5s.

"Everyone is or should be interested in twins." Thus our author in the first words of his Introduction. He might have added that the economic importance of twinning in those domestic mammals which usually bear only one at a birth makes the subject of twins of interest in more senses than one.

As everyone knows, twins fall into two categories, and are classified as those which are *binovular*, or develop from two ova fertilised at or about the same time, and *uniovular*, or arising from a single ovum. The subject of binovular twins offers little of abstruse biological interest. Uniovular twins, on the contrary, have exercised the ingenuity for explanation of many biologists. When Wilson and others demonstrated the comparative ease with which two larvæ could be produced from a single fertilised ovum by the mere mechanical separation of the two first blastomeres, it was natural that the production of uniovular twins in the higher vertebrates (including man) should be explained by the supposition that, in some way or other, an imitation of the experiments of the biologist had been indulged in by Nature. It was realised that herein also lay a simple explanation of the remarkable resemblance and agreement in sex between uniovular twins.

Unfortunately the theory of the separation of blastomeres has not been able to conform with certain recently revealed facts. It is now known that the nine-banded armadillo of Texas (*Dasypus novemcinctus*) normally produces twins, or rather quadruplets, all of the same sex, from a single ovum. How this is effected is lucidly explained by Newman, who has devoted eight years' study to the subject. Newman's discoveries have thrown an entirely new light on the problem of twinning, and there can be little question that they must form part of the knowledge of anyone who wishes to take an intelligent view of twin production.

Inseparably bound up with the subject of twins is the problem of the sterile female twin born co-twin to a normal male. Though the "free-martin" has been studied by many since John Hunter first expressed an opinion as to its nature, no theory evolved has seemed to be so probable as that recently propounded by Lillie (*Science*, vol. xlvi., 1916). Lillie has made a very careful examination of forty-one cases of bovine twins, and the pith of his conclusions is best given in his own words:

"In cattle a twin pregnancy is almost always the result of the fertilisation of an ovum from each ovary; the development begins separately in each horn of the uterus. The rapidly elongating ova meet and fuse in the small body of the uterus at some time between the 10 mm. and the 20 mm. stage. The blood-vessels from each side then anastomose in the connecting part of the chorion; a particularly wide anastomosis develops, so that either foetus can be injected from the other. The arterial circulation of each overlaps the venous territory of the other, so that constant interchange of blood takes place. If both are males or both are females no harm results from this; *but if one is male and the other female, the reproductive system of the female is largely suppressed, and certain male organs even develop in the female.* This is unquestionably to be interpreted as a case of hormone action. It is not yet determined whether the invariable result of sterilisation of the female at the expense of the male is due to more precocious development of the male hormones, or to a certain natural dominance of male over female hormones."

In writing his small book, Mr. Newman set himself a difficult task, for his aim has been to satisfy both the general and the technical reader without sacrificing unduly the demands of simplicity on the one hand or of scientific adequacy on the other. Doubtless the general reader will occasionally find himself beyond his depth, and sometimes the technical reader will wish that the author had been a little more detailed. But under the circumstances this was inevitable, and in no way detracts from the author's success in compressing so much into so small a space and preserving lucidity withal.

The high repute of the University of Chicago for typography and illustration will not suffer.

SCIENCE AND EDUCATION. Edited with an Introduction by Sir RAY LANKESTER, K.C.B. London: William Heinemann. 1917. Pp. 200. 1s.

The current demand for the proper recognition of science is no new thing. In 1854 we find seven scientists of surpassing eminence pointing out the desirability of making Natural Science an integral part of the education of all classes; and it has been a happy thought on the part of Mr. Heinemann to republish their lectures, delivered at the Royal Institution of Great Britain, in the present year of grace when the cry has been taken up afresh with redoubled vigour. In the editor and writer of the Introduction no more valiant champion of Natural Science could be found. Nor, it may be safely asserted, could one have been chosen more fitted by experience and knowledge to act the part of sponsor—if such were really needed—to a series of lectures which, though some of their matter may have been superseded, are still eminently worth reading as models of exposition.

It is difficult to make up one's mind which is the most fascinating of the seven lectures, but doubtless the veterinary and medical reader will be best

attracted to what Sir James (then Mr.) Paget said "On the Importance of the Study of Physiology as a Branch of Education for all Classes." One sentence therein has struck the present reviewer as specially worthy of remembrance by those in whose hands is entrusted the guidance of aspirants to a professional status.

"If we mark the peculiar fitness of certain men for special callings, who are even now below an average ability in the common business of life, one might imagine some natural design of mutual adaptation between things to be done and men to do them ; and, certainly, it were to be wished that a wider scheme of education should leave it less to chance whether a man will fall, or fail to fall, in the way of that special work for which he seems designed."

But doubtless there are many who will agree with Sir Ray Lankester in thinking that "the most interesting, and in many ways the most valuable, of the seven lectures now reprinted is that by the great Faraday."

✓ STUDIES IN INSECT LIFE AND OTHER ESSAYS. By ARTHUR EVERETT SHIPLEY, Sc.D., F.R.S. London : T. Fisher Unwin. 1917. Pp. ix. + 338. 10s. 6d.

Those to whom the previous popular books written by the Master of Christ's are familiar will welcome another from the same witty and graceful pen. Dr. Shipley's *Minor Horrors of War* procured for him a reading public of as diverse a nature as any writer could wish. Not only did the unscientific layman read the *Horrors* with interest and instruction : the scientist found it a very pleasant and not unprofitable means of spending a spare hour or two.

In his latest volume Dr. Shipley returns to some of the "minor horrors," but does not confine himself to these interesting (when Dr. Shipley writes about them) but irritating fauna. Indeed, only eighty-nine pages are devoted to insects. For the rest, one feels surprise that the author did not purloin the title of *A Diversity of Creatures* from a contemporary writer. On the whole, it would have been more apt than the one chosen. Or he might even, with slight modification, have taken Topsell's title-page as a model :

"*The History of Four-Footed Beastes.* Describing the true and lively figure of every Beast, with a discourse of their severall Names, Conditions, Kindes, Vertues (both naturall and medicinall), Countries of their breed, their love and hate to Mankinde, and the wonderful worke of God in their Creation, Preservation, and Destruction. Necessary for all Divines and Students, because the story of every Beast is amplified with Narrations out of Scripture, Fathers, Phylosophers, Physitians, and Poets : wherein are declared divers Hieroglyphicks, Emblems, Epigrams, and other good Histories, collected out of all the Volumes of Conradus Gesner, and all other Writers to this present day. By Edward Topsell. London, Printed by William Jefferard, 1607."

ON GROWTH AND FORM. By Professor D'ARCY W. THOMPSON, C.B., D.Litt., F.R.S. Cambridge: The University Press. 1917. Pp. xv. + 793. 2ls.

How is it that the fertilised ovum of the horse always becomes a horse and not, say, a sheep? Why do animals vary so much in size and shape, in external characters, and even in details of microscopic structure? Why, at the same time, are there so many resemblances? Why, for example, should the goat resemble the sheep in so many particulars? Why are some species small and others large? These and similar questions have probably exercised the scientist ever since science emerged from even darker ignorance.

Professor Thompson would answer the questions by a physical explanation, which some, perhaps, will regard not as an answer but as stating the problem in another way. Resemblances are produced by similar forces acting on similar material. Differences occur when dissimilar forces operate on the same material; or when similar forces operate on different material. Which is as much as to say that animals are physically what they are because they "must be." Given the nature of the material of which they are composed, and given the limiting conditions of growth, they could not possibly be otherwise than what they are.

THE SECRETION OF URINE. By ARTHUR R. CUSHNY, M.A., M.D., LL.D., F.R.S. London: Longmans, Green & Co. 1917. Pp. ix. + 241. 9s.

It is surprising that it should still be possible to say with truth that "no other organ of the body has suffered so much from poor work as the kidney, and in no other region of physiology does so much base coin pass as legal tender." When so much of rational medicine rests upon a proper understanding of the functions of one of the most important of the excretory organs, it was high time that the physiologist should take stock and endeavour, as far as possible, to jettison all that impedes progress. None can expect him whose business it is to apply physiological knowledge to the treatment of pathological conditions, to proceed with a feeling of security when "it is often complained that the physiology of the kidney given in the text-books is made up of a wrangle between the two great views of its activity." It was natural, therefore, that the secretion of urine should be included among the subjects to be dealt with in what promises to be an admirable series of monographs on physiology, published under the editorship of Professor E. H. Starling.

As was inevitable and logical, Professor Cushny early submits to critical examination the rival Bowman-Heidenhain and Ludwig theories of renal secretion, which he sets aside in favour of what he calls "the modern view," to which it would be unfair to attach the name of any individual investigator, seeing that it is the outcome of the work of many. The modern view accepts the general scheme of filtration and re-absorption of Ludwig, but, appreciating the inadequacy of the known physical forces, supplements them as far as is

necessary by the "vital activity" postulated by Heidenhain. In the matter of re-absorption, the modern theory holds that the constituents of the plasma, which Cushny terms "Threshold Bodies," are taken up by the cells of the tubules and returned to the blood, while the "No-threshold Bodies," such as urea, are rejected and can only escape by the ureter.

Since much was, and still is, expected of diuretic drugs as curative agents in certain conditions, the author's chapter on the action of diuretics and other drugs will be found of considerable value to those whose ambition it is to administer medicines in other than an empirical manner. The pathologist and practitioner will also find matters of interest in the two last chapters, wherein are embodied "some points which have arisen from the consideration of the normal function and which seem to have been neglected by the pathologist."

In his statement and critical examination of what has so far been done to elucidate the problem of the secretion of urine, Professor Cushny has performed a very valuable service to both physiology and pathology, and not least inasmuch as he has compiled a bibliography in which references are made to over four hundred papers and publications.

TUBERCULOSIS. By CLIVE RIVIERE, M.D., F.R.C.P. London: Methuen & Co. Pp. i.+27. 1917. 1s.

Messrs. Methuen are to be commended in that they are issuing a "Health Series" of little books, written in appropriately simple language, for the instruction of the layman. Dr. Clive Riviere's *Tuberculosis* will doubtless serve a very useful purpose in pointing out the possible channels of tuberculous infection and the measures by which infection may be minimised. In connection with the sources of infection we observe that he does not mention tuberculous meat. Respecting infection by milk, on the contrary, he has much to say.

"It has been stated that as many as 30 per cent. of the milch cows in this country are diseased, and on this figure it is estimated that there were as many as 1,250,000 tuberculous cattle in the United Kingdom in the year 1901. Not all these, of course, would supply tuberculous milk, a condition for which disease of the udder is generally required. But if we examine the matter from the point of view of the milk we find this food infected in a goodly proportion of cases.

"Thus in Liverpool (1912) 7·4 per cent. of samples of milk examined contained tubercle bacilli, in Manchester 8·1 per cent. averaged over a period of ten years, in Birmingham (1912) 19·6 per cent. In Edinburgh the proportion of infected samples was put by one observer at 13 per cent., by another as high as 20 per cent."

Nevertheless, the author evidently does not regard the presence of the tubercle bacillus in cow's milk as an unmixed evil, since he holds the bovine

type of bacillus as being almost certainly capable of conferring protection against disease caused by the human type of tubercle bacillus.

"Complete extermination of bovine tuberculosis is, indeed, not to be wished for, in the writer's opinion, so long as the human tubercle bacillus is rife amongst us—and, fortunately, such extermination is but little likely of accomplishment!"

He will scarcely expect the veterinary reader to be in *entire* agreement with him.

MICROSCOPIC ANALYSIS OF CATTLE FOODS. By T. N. MORRIS, B.A.
Cambridge: The University Press. 1917. Pp. viii.+74. 2s. nett.

The microscopical examination of foods, for the purpose of determining their composition and for the detection of adulterants, is a science of no mean importance, and as the report of the food microscopist is often of more value than that of the chemist it is not surprising that food microscopy is receiving more attention than it did formerly.

With the exception of Winton's exhaustive work on the microscopy of vegetable foods there was, until Mr. Morris compiled this little handbook, no guide in the recognition of the constituents of vegetable foods, and, as the author says, this is the only book in the English language dealing solely with cattle foods. It is, however, difficult to know for whom exactly it is written and the purpose it is intended to serve. Food microscopists will naturally have at hand the more complete text-book and their own preparations with which to refresh their memories or to settle any doubts as the need arises from time to time. It is to be presumed that the author had in his mind the requirements of the student, and for him no doubt the *Microscopical Analysis of Cattle Foods* will be a useful enough little book. In the first few pages the author explains such laboratory technique as it is necessary for one to be familiar with, omitting nothing that is essential and at the same time avoiding redundancy, a statement which applies to the book as a whole. Some fifty figures illustrate the text, and figures are naturally indispensable to any guide in histology. These are executed simply, but sometimes border on the crude. Elaborate drawings are, however, not altogether necessary, and nobody could expect works of art at the price at which this book is offered.

(R. G. L.)

THREE LECTURES ON EXPERIMENTAL EMBRYOLOGY. By J. W. JENKINSON, M.A., D.Sc. With a Biographical Note by R. R. MARETT, M.A., D.Sc. Oxford: At the Clarendon Press. 1917. Pp. xvi.+130. 7s. 6d.

Gallipoli has deprived Oxford of one of her most promising sons. Had not John Wilfred Jenkinson made "the great sacrifice," his published work shows sufficiently clearly that he would have come to occupy a brilliant

position in embryological science. The notes of the three lectures on experimental embryology, which form the substance of the book now before us, had, we are told, been laid aside for final revision before going to press. Though the final revision was never made, and the work as published has consequent imperfections, the science of embryology would have been poorer had the author's widow determined that the notes should not appear in print.

Being lecture notes, the book does not set forth the results of original observations; but it is nevertheless of much value, inasmuch as in it are collated, summarised, and correlated the more striking facts revealed by a very young but very fruitful department of science.

To him who is not a professed embryologist probably the most interesting section will be that wherein are discussed the determination of inheritable characters and the part played by the cytoplasm and the nucleus of the germ in their transmission to the offspring. Though faith in the conception of the chromosomes of the nucleus as the sole physical basis of heredity may have been shaken by experimental embryology, there is none who will not admit that no more than the fringe of the subject has as yet been touched.

HANDBOOK OF PHYSIOLOGY. By W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S. Thirteenth Edition (being the Twenty-sixth Edition of *Kirkes' Physiology*) London: John Murray. 1917. Pp. xx. + 930. 16s. nett.

Few books of its kind have had so interesting and so prosperous a history as has *Kirkes' Physiology*. First issued in 1848 as a volume of 705 pages, containing ninety-seven illustrations, "Kirkes'" quickly became a household name among students. How many have been guided along the intricate path of physiology by this handbook it would be difficult to estimate; but the publisher assures us that 77,000 copies in all (including the present edition) have been printed. Since Professor Halliburton took over the editorship in 1896 the book has undergone such changes that it was only just the old name of "Kirkes'" should be dropped.

The present edition, the twenty-sixth since 1848 and the thirteenth since Professor Halliburton took charge, runs to over 900 pages, and contains nearly 600 illustrations in the text and three coloured plates. It is not, therefore, in that category of scientific books for which the purchaser is required to disburse out of proportion to value received.

A new feature of the present edition is the adoption of the system of nomenclature (which nowadays can scarcely be called *new*) generally known as the B.N.A. nomenclature. "The new names have been widely adopted by anatomists, and medical students are under the disadvantage of learning one set of terms in the dissecting-room and another in the physiological laboratory. It need hardly be pointed out how confusing this must be to the learner." In adopting a nomenclature which is daily becoming more widely used, Professor Halliburton has been wise, and the value of his book is enhanced thereby.

THE TREATMENT OF INFECTED WOUNDS. By A. CARREL and G. DEHELLY.
Translation by HERBERT CHILD, with Introduction by Sir ANTHONY
A. BOWLBY. London : Baillière, Tindall & Cox. 1917. Pp. viii. +
238. 5s. nett.

Among the hundred and one changes which the present war has brought about it is fairly safe to say that wound treatment will find a place. No student of current literature can fail to be impressed by the great diversity of opinion which has been and is still being displayed by the surgeon respecting the manner in which sepsis in wounds should be rectified. This diversity proves, were it necessary, that former methods left something to be desired. At the same time this diversity breeds doubt whether the best method has yet been devised. Whatever the ultimate outcome may be, however, the civilian practitioner, veterinary no less than human, cannot afford to be ignorant of the methods already devised and advocated. For this reason the British reader can scarcely fail to be grateful to Mr. Child for his serviceable translation of Carrel and Dehelly's little book on *The Treatment of Infected Wounds*.

Thanks to the lay press, as much as or even more than to the scientific periodicals, everyone is more or less familiar with the principles of the Carrel treatment. The doubt which has been in the mind of the veterinary surgeon was one relative to the applicability of the mode of treatment to wounds in the lower animals. Instillation of Dakin's solution seemed to offer difficulty in veterinary surgery. On this point may be quoted the words of Sir Anthony Bowlby, who writes the Introduction to the translation. Referring to the various modifications of the method which have been tried or suggested, he says : "The only modification that seems justifiable is the use of the syringe when instillation by gravitation cannot be carried out."

We would also like to quote another sentence from the Introduction. "The whole practice of war surgery has been greatly improved by Dr. Carrel's confidence that antiseptic treatment can sterilise a septic wound, and that it does do so if sufficient care and skill are bestowed upon it ; and the lesson he has taught was very necessary."

THE CAUSES OF TUBERCULOSIS. By LOUIS COBBETT, M.D., F.R.C.S.
Cambridge : The University Press. 1917. Pp. xvi. + 707. 21s.

Though not addressed to the clinician, this book will nevertheless fill a want which the practitioner must have frequently felt. The professed object of the book is to provide those interested in the stamping out of tuberculosis with a convenient work of reference in which may be found the chief results of the labours of the experimental pathologist. And the author is right in saying that, though the field is limited by this outlook, it "has the compensating advantage that it opens up that aspect of it which is, perhaps, the least familiar."

Since the historic pronouncement of Koch at the London Congress on Tuberculosis in 1901, much has been done towards the elucidation of

problems respecting the relation of animal to human tuberculosis. But the results of research are mostly buried in Blue Books and other official publications. One of the author's main objects has been to bring together in handy form these researches, and particularly those of the late Royal Commission on Tuberculosis, the Local Government Board, the Department of Health of the City of New York, and the Berlin Imperial Board of Health.

Six chapters are devoted to the consideration of tuberculosis of various animal species (mostly domestic), and to these the veterinary reader will doubtless turn in the first place. To the veterinary reader the last chapter, on the part played by bovine infection in human tuberculosis, will also make special appeal.

The rapidly declining death-rate from tuberculosis affords an interesting subject for discussion. The decline has been attributed to several causes ; and it has even been hinted that partial immunisation of the human race by means of minimal infections with bovine bacilli has played a part in this decline. Dr. Cobbett, however, concludes that this cannot be asserted, because there is no evidence to show that such infections have been more frequent in recent years than in earlier ones. At the same time, observations lead to the view that a good deal of the capacity for resisting tuberculosis is attributable to this cause. This naturally leads to the question of what is to be done about tuberculosis in cattle. Are we to attempt to reduce or eradicate it in the hope of preventing a large proportion of the tuberculosis among children ? Or should we be worse off after all if such attempts were made, and were successful ?

"The harm done by the bovine bacillus is certain, the benefit it confers is problematical. . . . On the one hand, we ought not to lose the bone for the shadow ; we should not hesitate to attack the certain evil for fear of its problematical consequences ; and, on the other hand, we should be unwise to ignore the latter altogether. Bovine tuberculosis therefore should be dealt with firmly, but tentatively, the result of each measure being watched before the next is attempted."

Dr. Cobbett, writing, as he is, one of the Cambridge Public Health Series, naturally takes no cognisance of the economic side of bovine tuberculosis : a side of the problem which is of great importance from the national point of view. Messrs. MacKintosh, Pennington, and Stenhouse Williams have made an exceedingly conservative estimate of the total annual loss as being £273,192 (*Journ. Hygiene*, vol. xv., 30th July 1915).

The book owes much of its value to frequent lists of references ; and as a whole may be characterised as a most successful digest of the recent literature on tuberculosis as produced by the laboratory worker. It will be welcomed by all either closely or remotely interested in the public health side of the subject.

NOTES ON BOOKS.

THE INVOLUNTARY NERVOUS SYSTEM. By W. H. GASKELL, M.A., M.D., F.R.S. London : Longmans, Green & Co. 1916. Pp. 178. 6s.

The late Professor Gaskell worked for over forty years on the subject of the morphology and physiology of the involuntary nervous system. The present book forms a compendium of his work. The clinical bearing of some of his conclusions is not far to seek.

MODERN HORSE MANAGEMENT. By R. S. TIMMIS, Royal Canadian Dragoons. London : Cassell & Co. (No Date.) Pp. xvii. + 233. 12s. 6d. nett.

A popular guide to horse management, containing information on a very wide range of subjects and profusely illustrated.

ARACHNIDA AND MYRIOPODA. By STANLEY HIRST. British Museum (Natural History) Economic Series. 1917. 6d. (Postage 1d.).

ORGANISM AND ENVIRONMENT AS ILLUSTRATED BY THE PHYSIOLOGY OF BREATHING. By Dr. J. S. HALDANE (Yale University Press). London : Oxford University Press. Pp. xi. + 138. 1917. 5s. 6d.

A CLASS-BOOK OF ORGANIC CHEMISTRY. By Professor J. B. COHEN. London : Macmillan & Co. 1917. Pp. viii. + 344. 4s. 6d.

L'ŒUF ET LES FACTEURS DE L'ONTOGÈNESE. By Professor A. BRACHET. Paris : O. Doin et Fils. 1917. Pp. xii. + 349. 6 francs.

DAS MIKROSKOP UND SEINE NEBENAPPARATE. By H. GUNTHER. Stuttgart : Franckhsche Verlagsbuchhandlung. 1917. 108 Figures. 2.25 marks (3 marks, Bound).

MANUAL DE HIGIENE VETERINARIA. By PEDRO MOYANO Y MOYANO. Saragossa : Tipografia Hospicio. 1917. Pp. 400. 6 pesetas.

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STEWART, S. L. "Anatomical Review and Consideration of Congenital Weakness of the Hock of Equidae." *Amer. Journ. Vet. Med.* Vol. XII., No. 8. August 1917. Pp. 512-514. 5 Figures.

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An account of two cases of a disease fatal to suckling colts. In addition to the kidneys, other organs, as well as joints, were affected. An organism, of which further study is being made, was isolated.

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HART, E. B., MCCOLLUM, E. V., STEENBOCK, H., and HUMPHREY, G. C. "Physiological Effect on Growth and Reproduction of Rations Balanced from Restricted Sources." *Journ. Agric. Res.* Vol. X., No. 4. 23rd July 1917. Pp. 175-198. 15 Plates (76 Figures), 9 Tables.

LÉPINAY, L. "Economy in the Feeding of Horses" (Economies à réaliser sur la nourriture des chevaux). *Rev. Path. Comp.* Vol. XVII., No. 135. June 1917. Pp. 22 (170)-23 (171).

Pleads for economy to be achieved by giving horses food out of the ordinary run of feeding-stuffs. Meat powder has been used, and it is suggested that nettles, ferns, the leaves of many trees, etc., might be employed.

LINTON, R. G. "Some Maize By-Products." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 276-282.

— and PETRIE, W. S. "The Dietetic Value of Wheat Bran." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. Pp. 185-199. 2 Plates (4 Figures).

PIROCCHI, A. "Rice-Bran as a Food for Working Oxen" (La pula vergine di riso nell' alimentazione dei buoi da lavoro). *La Clinica Vet.* Vol. XL., Nos. 14-15. 30th July-15th August 1917. Pp. 428-442.

WEILL, E., and MOURQUAND, G. "The Alimentary Value of Barley" (L'orge dans le pain de guerre. Recherches expérimentales sur la valeur alimentaire de l'orge). *Bull. Acad. Méd.* Vol. LXXVII., No. 26. 26th June 1917. Pp. 824-826.

Barley has an alimentary value near to that of wheat, but experimentally inferior to that of maize and rice (corticated).

GENERAL.

BARTOLUCCI, A. "The Cattle of Romagna" (*Razza bovina romagnola*). *Il Moderno Zooiatro*. Parte Sci. Ser. V., Vol. VI., No. 6. 30th June 1917. Pp. 145-152. *Ibid.* No. 7. 31st July 1917. Pp. 166-176. *Ibid.* No. 8. 31st August 1917. Pp. 182-195. 14 Figures.

BIRCH, R. R. "Stallion License Laws." *Cornell Veterinarian*. Vol. VII., No. 3. July 1917. Pp. 192-198.

The results of the Minnesota and Kansas laws are as follows:—"In 1911 Minnesota had 1488 pure-bred stallions standing for public service, and in 1916 the number stood at 2053—an increase of 37 per cent. During the same period the number of grade and scrub stallions standing for public service decreased from 2535 to 1898 (25 per cent.). In 1910 Kansas had registered 2599 pure-bred and 3766 grade stallions; in 1915 there were 3244 pure-breds—an increase of 24 per cent.—and 2511 grades—a decrease of 30 per cent. In New York horse-breeding is almost a lost art."

CAMPBELL, D. M. "Some Legal Phases of Veterinary Practice." *Amer. Journ. Vet. Med.* Vol. XII., No. 7. July 1917. Pp. 433-438.

Refers to legal decisions as given in the United States.

DECHAMBRE, P. "The Horses of the United States" (*Les chevaux des États-Unis*). *Rec. Méd. Vet.* Vol. XCIII., No. 15. 15th August 1917. Pp. 397-416. 2 Figures, 1 Map.

LACROIX, J. V. "War Horses in Camp." *Amer. Journ. Vet. Med.* Vol. XII., No. 7. July 1917. Pp. 439-441.

LEESE, A. S. "'Tips' on Camels, for Veterinary Surgeons on Active Service." *Vet. Journ.* Vol. I.XXIII., No. 6. June 1917. Pp. 214-218. *Ibid.* No. 7. July 1917. Pp. 253-259. *Ibid.* No. 8. August 1917. Pp. 294-298.

MACHT, D. I. "On the Etymology, Popular and Scientific, of the Terms for the Kidney in Various Languages." *Bull. Johns Hopkins Hosp.* Vol. XXVIII., No. 316. June 1917. Pp. 204-208.

MARTINOLI, G. "Horse-Breeding in the Argentine Republic at the Present Day." *Internat. Rev. Sci. and Practice Agric.* Vol. VIII., No. 6. June 1917. Pp. 819-825.

GENETICS AND HEREDITY.

WILLIAMS, W. L. "Roaring in Horses as it Relates to Horse-Breeding." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 624-635.

Professor Williams is opposed to the disqualification of a stallion for roaring, because, in addition to his thorough disbelief in the heredity of roaring, the exclusion of such stallions is especially liable to destroy the usefulness of the best breeding stock.

HISTORICAL.

HOARE, E. W. "Pioneers in Veterinary Medicine, Bracy Clark, F.L.S. 1771-1860." *Vet. News.* Vol. XIV., No. 702. 16th June 1917. Pp. 243-246. *Ibid.* No. 703. 23rd June 1917. Pp. 251-255.

SMITH, F. "The Early History of Veterinary Literature and its British Development." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. Pp. 97-130.

A continuation of Major-General Smith's historical review.

HYGIENE AND PREVENTIVE MEDICINE.

ALLEN, P. W. "Comparisons of the Rate of Gas Production by Certain Bacteria in Raw and Pasteurised Milk." *Journ. Inf. Dis.* Vol. XXI., No. 2. August 1917. Pp. 219-225. 5 Tables, 3 Figures.

Pasteurisation causes milk to become more favourable to the attack of the gas-forming colon bacillus and *B. aerogenes*. Pasteurised milk should receive greater care than raw milk, because of its lessened resistance to many detrimental changes which the appearance of the milk does not indicate.

DITZWIG, G. "The Meat-Inspection Service of the United States Department of Agriculture." Separate from the *Yearbook Dept. Agric.* 1916. No. 714. Pp. 1-21. 11 Plates (22 Figures).

An account of the mode of procedure followed in the Meat-Inspection Division, Bureau of Animal Industry.

HODGKINS, J. R. "Disinfection of Standings." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 285-286.

HOWARTH, W. J. "Meat Inspection, with Special Reference to the Developments of Recent Years." *Lancet.* Vol. CXCIII., No. 4901. 4th August 1917. Pp. 147-153. *Ibid.* No. 4903. 18th August 1917. Pp. 225-231. *Ibid.* No. 4905. 1st September 1917. Pp. 335-341. 15 Tables.

MARTEL, H. "Sterilisation of Condemned Meat" (Les viandes assainies susceptibles d'être livrées à la consommation). *Rec. Méd. Vét.* Vol. XCII., No. 16. 30th August 1917. *Bull. Soc. Centr. Méd. Vét.* Pp. 303-318.

— "The Employment of Chemical Substances for the Preservation of Meat" (Au sujet de l'emploi des substances chimiques pour la conservation des viandes). *Rec. Méd. Vét.* Vol. XCII., No. 16. 30th August 1917. *Bull. Soc. Centr. Méd. Vét.* Pp. 318-324.

MITCHELL, J. F. "Laboratory Milk and Meat Inspection." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 363-373.

An account of the equipment necessary.

WILLIAMS, R. S., and CORNISH ELFRIDA, C. V. "The Milk Supply: A Suggestion." Cambridge: The University Press. 1917. Pp. 10.

"The essentials of a satisfactory milk supply are healthy cows, clean milking, immediate cold, and the carriage and delivery of the milk at a low temperature, in sealed vessels, to its destination within a reasonable time."

The suggestion made herein is that the milk should be received at a refrigerating factory at the rail-head, whence it is sent in refrigerated vans to the distributor. It should be kept cold in its transit from the railway terminus to the consumer.

INFECTIOUS DISEASES.

ARMFIELD, J. M. "Anthrax: A Peculiar Case." *Vet. Journ.* Vol. LXXXIII., No. 8. August 1917. P. 288.

A case of anthrax in cattle in which the spleen was normal.

BELIN. "Oxido-therapy in the Treatment of Tetanus" (De l'oxydothérapie dans le traitement du tétanos). *Rec. Méd. Vét.* Vol. XCIII., No. 12. 30th June 1917. *Bull. Soc. Centr. Méd. Vét.* 21st June 1917. Pp. 244-248.

This may be regarded as the continuation of a previous paper by the same author (see this *Review*, Vol. I. pp. 10-11). Herein is described the successful treatment of a case of tetanus by the intravenous injection of from 10 to 50 c.c. of a 3 per 1000 solution of permanganate of potassium.

BERNARDINI, D. "Sterility and Abortion" (Sterilità e aborto). *La Clinica Vet.* Vol. XL., No. 12. 30th June 1917. Pp. 331-336.

BIRCH, R. R. "Hog Cholera Transmission through Infected Pork." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 303-330. 5 Tables, 3 Charts.

— "A Note on the Immunity of Sucking Pigs to Hog Cholera." *Cornell Veterinarian.* Vol. VII., No. 3. July 1917. Pp. 199-200.

Two pigs of a hyperimmune sow died from natural exposure to swine fever at the ages of thirty-one and thirty-seven days respectively, and it is possible that another pig (twenty-seven days old) must be added. These pigs were all nursed by a hyperimmune mother until they refused food on account of sickness. "These observations add emphasis to the fact that although the pigs of immune sows are often immune while being suckled, it is not always safe to depend on this immunity."

✓ BRANDFORD, R. "Note of an Outbreak of Contagious Pneumonia in Donkeys." *Vet. Record.* Vol. XXX., No. 1513. 7th July 1917. Pp. 1-4. 4 Charts.

The age incidence was as follows:—Under one year, 100 per cent.; between one and two years, 38 per cent.; between three and four years, 33 per cent.; over three years, 20 per cent. Two ponies and two mules exposed to the infection did not contract the disease.

The outbreak occurred at the Government Farm, Hissar.

BRINGARD. "Treatment of Epizootic Lymphangitis" (Un traitement de la lymphangite épidémiologique). *Rec. Méd. Vét.* Vol. XCII., No. 12. 30th June 1917. *Bull. Soc. Centr. Méd. Vét.* 7th June 1917. Pp. 216-222.

BURGON, A. P. "Joint-Ill and Strangles in Foals." *Vet. News.* Vol. XIV., No. 712. 25th August 1917. Pp. 342-343.

The writer thinks there is a connection between the two diseases.

BURMEISTER, W. H. "Effect of the Injection of Non-specific Foreign Substances on the Course of Experimental Rabies." *Journ. Inf. Dis.* Vol. XXI., No. 1. July 1917. Pp. 95-107. 5 Tables.

"The injection of certain non-specific substances (horse serum, serum globulin, egg-white, egg-yolk, broth, typhoid vaccine, or tuberculin) does not inhibit the course of experimental rabies produced in rabbits by non-attenuated virus."

BURTON, A. C. "Stomatitis Contagiosa in Horses." *Vet. Journ.* Vol. LXXIII., No. 7. July 1917. Pp. 234-242. 4 Figures.

EICHHORN, A., and POTTER, G. M. "Contagious Abortion of Cattle." *Farmers' Bull.*, 190. United States Dept. Agric. January 1917. Pp. 12.

If contagious abortion in cattle continues to increase it will soon surpass tuberculosis, which is now thought to stand first among animal diseases in point of economic loss. A bull may spread the disease from a diseased cow to healthy animals. A cow that has aborted is likely to become immune to the disease; therefore, if she is a profitable animal, it is best to keep her.

FAVERO, F. "Arsenivan in the Treatment of Epizootic Lymphangitis" (L'arsenivan nella cura del farcino criptococcico). *Il Moderno Zootiato. Parte Sci. Ser. V.*, Vol. VI., No. 6. 30th June 1917. Pp. 129-136.

FELDMAN, W. H. "Milk-Borne Infections." *Amer. Journ. Vet. Med.* Vol. XII., No. 8. August 1917. Pp. 515-517.

FORGEOT. "Glanders in the Army" (Quelques considérations d'ordre économique sur l'affection morvo-farcineuse dans l'armée). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 19th April 1917. Pp. 183-185.

The curability of glanders of the horse having been long demonstrated, the author thinks it would be possible, and economically sound, to treat many cases, suitable precautions being observed.

GAUDUCHEAU, A. "Variola-Vaccinia" (Recherches sur variole-vaccine). *Bull. Soc. Path. Exot.* Vol. X., No. 3. March 1917. Pp. 260-268.

There is no symptom by which one can absolutely and constantly differentiate between variola and vaccinia. Variola confers immunity against vaccinia and vice versa. Positive results have been obtained in attempts to transform variola into vaccinia. There are two varieties or types of the same virus, the difference depending upon the degree of adaptation to the susceptible species—variola is the human variety, vaccinia the bovine variety.

GORMAN, R. "British Redwater." *Vet. News.* Vol. XIV., No. 699. 26th May 1917. Pp. 213-215. *Ibid.* No. 700. 2nd June 1917. Pp. 221-222. *Ibid.* No. 701. 9th June 1917. Pp. 230-231.

Great Britain is in great need of preventive measures capable of universal application.

HOLMES, R. P. "The Intradermal Palpebral Mallein Test for Glanders." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. Pp. 200-205.

Captain Holmes gives a detailed description of the mode of application and manifestations of the test in non-reactors and reactors. The extensive use of the method during the present war has led to its being almost universally recognised as the quickest and most convenient method of testing

where a large number of animals have to be dealt with. From the writer's own experience in testing many thousands of horses and mules he is thoroughly convinced that, when carefully carried out, it is the best method. On more than one occasion it has proved itself a more delicate test than the usual method of subcutaneous injection of ordinary mallein in the neck.

MARTEL. "Rabies in Paris and the Department of the Seine" (*La rage à Paris et dans le département de la Seine*). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 19th April 1917. Pp. 157-176. 7 Figures.

MORI, N. "The Specific Organism of Stomatitis Pustulosa Contagiosa of the Horse" (*Sul germe specifico della Stomatite pustulosa contagiosa degli equini o Afta di Regis*). *La Clinica Vet.* Vol. XI., No. 13. 15th July 1917. Pp. 381-383.

Mori points out that in 1909 he isolated an organism, apparently the same as that demonstrated recently by Gregg (see this *Review*, Vol. I. p. 328), but grants to Gregg the merit of having demonstrated the specificity of the microcococcus. The reference to Mori's paper is "Studio sulla Stomatite pustulosa contagiosa od Afta equina" (*La Clinica Vet.*, Sezione pratica, No. 42, 1909).

PANISSET, L. "Vesicular Stomatitis in the Horse" (*A propos de la stomatite vésiculeuse du cheval (stomatite ulcéreuse, stomatite érosive)*). *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 305. 15th May 1917. Pp. 181-183.

A short account of some recent papers on the disease.

PERRIN. "The Period of Incubation of Epizootic Lymphangitis" (*Notes sur la détermination de la période d'incubation de la lymphangite épizootique en France*). *Rec. Méd. Vét.* Vol. XCII., No. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 3rd May 1917. Pp. 191-194.

PROESCHER, F., and SEIL, H. A. "The Etiology of Hog Cholera." Second Report. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 609-616. 3 Tables, 13 Figures.

REMLINGER, P. "Rabies in the Guinea-Pig" (*La rage spasmodique du cobaye*). *C. R. Soc. Biol.* Vol. LXXX., No. 12. 16th June 1917. Pp. 590-592.

Describes a form of the disease as manifested in the guinea-pig to which it is proposed to apply the name of *spasmodic rabies*.

— "The Virus of Rabies in its Passage from Guinea-Pig to Guinea-Pig" (*Le virus rabique dans ses passages de cobaye à cobaye*). *C. R. Soc. Biol.* Vol. LXXX., No. 13. 30th June 1917. Pp. 628-630.

SANI, L. "The Dog as a Carrier of Anthrax" (Il cane nella propagazione del carbonchio ematico). *La Clinica Vet.* Vol. XL., No. 11. 15th June 1917. Pp. 315-324.

SCOTT, W. "Do Fistulae of the Poll and Withers in the Mare Predispose to Joint-Evil in the Foal?" *Vet. Record.* Vol. XXIX., No. 1512. 30th June 1917. Pp. 539-541. *Vet. News.* Vol. XIV., No. 706. 14th July 1917. Pp. 280-281.

The experience of the writer inclines him to think they do.

TABUSSO, M. E. "Enzootic Paraplegia of Lambs" (Paraplegia enzootica negli agnelli). *La Clinica Vet.* Vol. XL., No. 16. 31st August 1917. Pp. 457-472. 1 Figure.

This is a preliminary account of a neuro-muscular disease which affects young lambs in certain zones of high altitude in the Cordilleras of Peru. The etiology of the disease is entirely obscure.

THOMPSON, H. "Tetanus: Some Earlier Treatments." *Vet. Record.* Vol. XXX., No. 1523. 15th September 1917. Pp. 109-110.

The writer considers that there are three forms of tetanus—acute, sub-acute, and chronic.

TRUCHE, C. "Treatment of Ulcerative Lymphangitis by Bacterio-therapy" (Traitement de la lymphangite ulcéreuse par la bactériothérapie). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 19th April 1917. Pp. 155-180. (Traitement bactériothérapeutique de la lymphangite ulcéreuse). *Ann. Inst. Past.* Vol. XXXI., No. 5. May 1917. Pp. 209-214.

VAN SACEGHEM, R. "Suspected Cases of East Coast Fever in the Congo" (Cas suspects d'East Coast fever au Congo). *Bull. Soc. Path. Exot.* Vol. X., No. 3. March 1917. Pp. 172-173.

At Zambi, Lower Congo, the author has observed a disease in cattle in which the clinical manifestations and the post-mortem lesions corresponded exactly to those of East Coast fever. All the affected animals died, and, in the course of a few months, the mortality rose to 40 per cent. of the cattle in the district. A very few rod-shaped bodies, resembling *Theileria*, were found in the red blood-corpuscles; but no Koch's blue bodies were discovered.

VELU. "Treatment of Epizootic Lymphangitis by Vaccino-therapy" (Le traitement curatif de la lymphangite épizootique par la vaccino-thérapie). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 3rd May 1917. Pp. 195-204.

WASHBURN, H. J. "Anthrax or Charbon." *Farmers' Bull.*, 784. United States Dept. Agric. February 1917. Pp. 16.

WILLIAMS, W. L. "Abortion in Dairy Cattle." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 348-363. 3 Charts.

MEDICINE.

ALDIGÉ. "Snake-Bite" (Morsure par serpent venimeux). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 19th July 1917. Pp. 276-278.

An account of the clinical manifestations and a partial post-mortem examination in a case of snake-bite in an eighteen months' bull.

BOLTON, R. R. "The Examination of the Eye." *Cornell Veterinarian.* Vol. VII., No. 3. July 1917. Pp. 185-192.

A general description of the mode of examination.

BOND, P. G. "Struck by Lightning." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. Pp. 209-211.

BOUCHET. "Old Diaphragmatic Hernia in a Horse" (Hernie diaphragmatique ancienne chez un cheval). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 265-267.

In a well-nourished horse an aperture was found in the diaphragm occluded by a hernia and adhesion of the omentum. The opening was surrounded by a thick fibrous ring. The animal died as the result of a second and more extensive rupture of the diaphragm.

CHAMBERS, F. "Note on the Treatment of Specific Ophthalmia." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. Pp. 136-137.

Specific ophthalmia is very common in horses and cattle in tropical Africa. Captain Chambers has had excellent results from the treatment suggested by Wiggs (*Amer. Journ. Vet. Med.*, April 1912). "One c.c. of Lugol's solution is injected deep into the supra-orbital fat. . . . One injection usually suffices, but if the case is not making satisfactory progress in a week a second injection should be given."

COLLINSON, W. "Camphor in the Treatment of Tetanus." *Vet. Record.* Vol. XXX., No. 1519. 18th August 1917. Pp. 71-72.

An account of the use intravenously or hypodermically of camphorated ether and camphorated oil in four cases of tetanus. Two cases recovered and two ended fatally.

FLORIOT. "The Ill-Effects of Mud" (Les méfaits de la boue). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 133-138.

— "Chronic Fatigue" (Le surmenage chronique). *Rec. Méd. Vét.* Vol. XCIII., No. 15. 15th August 1917. Pp. 416-425.

FORGEOT. "Auto-Infection of Intestinal Origin in Animals Transported by Sea" (L'auto-infection d'origine intestinale par stabulation prolongée dans les transports d'animaux en mer). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917 *Bull. Soc. Centr. Méd. Vét.* 19th April 1917. Pp. 180-182.

GREGG, J., MAGUIRE, F. X., GILLESPIE, A., GLOVER, G. S., and LAUGHLIN, H. W. "Pneumonia: Its Prevention and Treatment as Observed at the British Remount Depôt, Newport News, Va." *Amer. Journ. Vet. Med.* Vol. XII., No. 8. August 1917. Pp. 505-511.

LISSOT, G. "Purpura Hæmorrhagica in the Cow" (Purpura hémorragique chez la vache). *Rec. Méd. Vét.* Vol. XCIII., No. 13. 15th July 1917. Pp. 357-360.

The author has observed three cases of what he believes to be purpura in the cow; two of the cases ended fatally. He describes the clinical and post-mortem features of the latest case. Petechiae were present on all the mucous and serous membranes.

MCINTYRE, G. "Remarks on Sand Colic as Met with in Egypt." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 282-284.

The author has had most success in the treatment of sand colic from the use of ammonium carbonate followed by linseed oil and turpentine. He does not believe in the use of sedatives, except in very severe cases where it is necessary to prevent the animal injuring itself. Arecolin and eserin he considers dangerous.

MARTIN, W. J. "The Economic Importance and General Prevalence of Periodic Ophthalmia." *Amer. Journ. Vet. Med.* Vol. XII., No. 8. August 1917. P. 520.

Good hygienic conditions are insisted upon as a preventive.

NEW, A. "Fits in Dairy Cows." *Vet. Record.* Vol. XXX., No. 1514. 14th July 1917. P. 14.

PAINES, R. "Rickets in Donkeys." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. Pp. 134-135. 2 Figures.

The disease is very prevalent among donkeys and sheep in the Northern Transkeian territories.

POTTIE, J. D. "Pressure as the Cause of Disease in Animals. Pressure as an Aid to the Cure of Animal Disease." *Vet. News.* Vol. XIV., No. 709. 4th August 1917. Pp. 311-312.

VALADE. "Note on Intestinal Accretions in the Horse" (Courte note sur les égagropiles du cheval). *Rec. Méd. Vét.* Vol. XCIII., No. 11. 15th June 1917. Pp. 279-281.

Insufficiency of rations, the writer thinks, leads the horse to eat any kind of vegetable debris which is procurable. This, mixed with sand, forms the intestinal accretion. The formation may be slow, and no clinical manifestations may be shown until the accretion has attained a certain volume. The symptoms are those of intestinal obstruction, the accretion occluding the orifice of communication between the cæcum and the colon.

METHODS.

CLARK, W. M., and LUBS, H. A. "A Substitute for Litmus in Milk Cultures." *Journ. Agric. Res.* Vol. X., No. 3. 16th July 1917. Pp. 105-111.

As there are certain disadvantages in the use of litmus in milk cultures, the authors advocate the substitution of dibromoorthocresolsulfonphthalein, for which they suggest the short name of "bromoresol purple."

HENRY, H. "A Simple Device for the Growth of Anaerobes on Plates." *Brit. Med. Journ.* No. 2945. 9th June 1917. Pp. 762-763. 1 Figure.

An inexpensive and simple device, consisting of two Petri dishes, the metal top of the cardboard cylinder in which drugs are now exported to France, and some plasticine.

SMILLIE, W. G. "New Anaerobic Methods." *Journ. Exp. Med.* Vol. XXVI., No. 1. July 1917. Pp. 59-66. 2 Figures, 1 Plate.

Anaerobic methods have been devised which depend upon the catalytic action of platinised asbestos upon hydrogen and oxygen. The methods may be used for the growth of anaerobes in test-tubes, upon Blake bottles, in flasks, and in a large container. Because oxygen is so completely removed, the methods are of great value in the cultivation of absolute anaerobes.

TRIBONDEAU, L. "Stains and Methods of Staining" (Quelques colorants et procédés de coloration). *Ann. Inst. Pasteur.* Vol. XXXI., No. 8. August 1917. Pp. 412-435.

The object of this article is to collect together certain methods in the preparation and use of stains devised by the author in collaboration with M. Fichet and J. Dubreuil. A bibliographical index is appended.

OBSTETRICS.

ONORO, E. "Superfetation in a Mare" (Un caso de superfecundacion en la yegua). *Revista Hig. y Sanidad Pecuar.* Vol. VII., No. 4. July 1917. P. 214.

A fourteen-year-old mare, served first by a donkey and twelve days afterwards by a horse, gave birth to a foal and a mule.

PICHON. "Apparatus for the Prevention of Utero-Vaginal Eversion" (Bandage contre le renversement utéro-vaginal). *Rec. Méd. Vet.* Vol. XCIII., No. 13. 15th July 1917. Pp. 355-357. 2 Figures.

The apparatus consists of steel wire, 6 mm. in thickness, bent so as to fit closely round the anus and vulva. Its advantages are that it causes no wound, nor does it produce inconvenience to the patient. The inventor has left the apparatus in position for eight to ten days when this was necessary.

PARASITOLOGY

(Including Entomology and Protozoology).

BĚKENSKY. "The Spirochætes of the Intestinal Tract of Birds" (Les spirochètes des tractus intestinal des oiseaux). *Rec. Méd. Vet.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 19th July 1917. Pp. 284-288.

BLANC, G. "A Case of Canine Toxoplasmosis" (Sur un cas de toxoplasmose canine observé en Tunisie). *Bull. Soc. Path. Exot.* Vol. X., No. 5. 9th May 1917. Pp. 377-378.

This is the first case of toxoplasmosis in the dog recorded from Tunis. There is considerable doubt respecting the mode of infection.

BROWN, W. G. "The Maggot-Fly." *Queensland Agric. Journ.* Vol. VII., No. 2. February 1917. P. 85.

The writer suggests the destruction of the flies by the liberation of poison gas, the sheep having been removed to higher ground.

— "The Blow-Fly Pest." *Queensland Agric. Journ.* Vol. VII., No. 3. March 1917. P. 119.

Cross-bred sheep and sheep with light, dry wool are not so often attacked by the blow-fly as are merino sheep, in which the wool is dense and greasy. It is suggested that attacks might be prevented by thorough washing of the sheep at the beginning of the summer, and so removing the dirt and grease from the wool. Experiments show that the efficacy of dips depends to a considerable extent upon their cleansing properties.

CANNON, G. T. "Notes on Development of Oestrus Larvæ in the Pharynx of the Horse." *Vet. Record.* Vol. XXX., No. 1523. 15th September 1917. Pp. 107-109. 1 Plate.

Records the occurrence of the larvæ of *Gastrophilus pecorum* in the pharynx of fifteen horses from South Africa.

CARPANO, M. "A Spirochæte Observed in the White Rat" (Su di uno spirochete osservato nel topo bianco (*Mus rattus*) e qualche considerazione su alcuni spirochetti saprofitti). *Il Nuovo Ercolani.* Vol. XXII., No. 10. 31st May 1917. Pp. 163-168.

CORY, E. N. "The Protection of Dairy Cattle from Flies." *Journ. Econom. Entom.* Vol. X., No. 1. February 1917. Pp. 111-113.

Preliminary experiments seem to show that an increased yield of milk can be secured as the result of protecting cattle from flies by the use of a spray. The spray now used is a 3 per cent. emulsion of pine-tar creosote in caustic soda solution. Two-thirds of a pound of caustic soda is dissolved in water for every gallon of creosote that is to be emulsified. The emulsion is effective for one day only, but affords some protection for three or even four days.

DESCAZEUX and LAUGIER. "The Treatment of Mange by Baths" (Notes complémentaires sur le traitement de la gale par les bains). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 267-271.

DOUVILLE. "Treatment of Mange in the Horse" (Quelques réflexions sur la gale du cheval). *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 306. June 1917. Pp. 225-237.

FATTORE, E. "Trichinosis" (La trichina e le carni trichinate). *Il Nuovo Ercolani.* Vol. XXII., No. 15. 15th August 1917. Pp. 229-233.

A short résumé of the present knowledge of trichinosis.

GAY. "Organisation of a Dépôt for the Treatment of Mange by the 'Bain-piscine'" (Organisation du service dans un dépôt de chevaux galeux traités par la méthode du bain-piscine). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 152-155.

GREGGIO, G. "Trypanosomiasis of Pigs" (Trypanose des porcs; relations des porcs avec la trypanose humaine dans la vallée de l'Inkissi (Moyen Congo belge)). *Bull. Soc. Path. Exot.* Vol. X., No. 2. February 1917. Pp. 113-117.

From his observations in the Inkissi Valley, Middle Belgian Congo, the author concludes that there is no direct relationship between trypanosomiasis

in pigs and trypanosomiasis in man; but the presence of pigs favours the multiplication of *Glossina*, and in those places which are most suitable for rearing pigs the fly abounds.

GUILLEBEAU, A. "The Frequency of the Cysticercus of *Tænia saginata* in Switzerland" (Die Häufigkeit der Finne der *Tænia saginata* in der Schweiz und die Bekämpfung derselben durch die Fleischschau). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 8. August 1917. Pp. 425-429.

HAAS. "Description of Bath Used for Horses in the British Army" (Description d'une piscine anglaise destinée à donner des bains aux chevaux de l'armée britannique). *Rec. Méd. Vét.* Vol. XCII., No. 16. 30th August 1917. *Bull. Soc. Centr. Méd. Vét.* Pp. 324-328. 3 Figures.

HADWEN, S. "The Life-History of *Hypoderma bovis* and *H. lineatum*." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917 Pp. 541-544.

HALL, M. C. "Parasites of the Dog in Michigan." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 383-396.

— "Notes in Regard to Horse Lice," *Trichodectes* and *Hematopinus*. *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 494-504. 3 Figures.

— "Manure Disposal as a Factor in the Control of Parasitic Diseases of Live Stock." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 675-678.

HEAD, A. S. "Mange in the Horse." *Vet. News.* Vol. XIV., No. 701. 9th June 1917. P. 232.

KIRK, H. "Skin Diseases of the Horse." *Vet. News.* Vol. XIV., No. 710. 11th August 1917. Pp. 320-323. 3 Figures.

In many cases of mange there is found, not the ordinary mange parasite, but the forage acarus. Figures of Mark I., II., and IV. forage acari are given. The writer has found Canadian ringworm very resistant to treatment, but has obtained the best results from the use of calcium sulphide.

LÉPINAY, L. "Sarcoptic Mange in Horses" (Quelques notes sur le traitement des chevaux galeux). *Rev. Path. Comp.* Vol. XVII., No. 135. June 1917. P. 10 (158).

MACFIE, J. W. SCOTT. "The Morphology of Certain Spirochætes of Man and Other Animals." *Ann. Trop. Med. and Parasitol.* Vol. X., No. 3. 16th December 1916. Pp. 305-343. 6 Figures, 8 Tables.

"Spirochætes of the *S. eurygyrata* type have been found in the faeces of certain of the lower animals examined at Accra. The first type was found in a monkey, a cat, rats, sheep, cattle, goats, and pigs, and appeared to be morphologically indistinguishable from *S. eurygyrata*, the species found in man. The second type, for which the name of *S. canis* is proposed, was found in dogs and cats. This was a smaller organism, measuring most commonly 2 μ to 3 μ in length, and about 0.2 μ in breadth."

MANGIN. "A New Treatment for Lice in Horses" (Traitement nouveau de la phtiriase équine). *Rec. Méd. Vét.* Vol. XCII., No. 12. 30th June 1917. *Bull. Soc. Centr. Méd. Vét.* 7th June 1917. Pp. 239-242.

MOORE, A. E. "Sheep Scab." *Agric. Gaz., Canada.* Vol. IV., No. 4. April 1917. Pp. 262-265.

— W. "Toxicity of Various Benzene Derivatives to Insects." *Journ. Agric. Res.* Vol. IX., No. 11. 11th June 1917. Pp. 371-381. 4 Graphs, 2 Tables.

MOTE, D. C. "Observations on the Distribution of Warble Flies in Ohio." *Ohio Journ. Sci.* Vol. XVII., No. 5. March 1917. Pp. 169-176. 1 Map, 1 Figure, 3 Tables.

PARKER, T. "A Case of Equine Scabies in the Mouse." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. Pp. 206-208. 1 Figure.

The writer suggests the possibility of spread of mange by mice, and perhaps also rats and cats, which become affected while living in infected stables.

— "Three Cases of Sarcoptic Mange in Man." *Vet. Journ.* Vol. LXXIII., No. 7. July 1917. Pp. 243-245.

All three cases were contracted from the horse.

RAILLET. "Two Nematodes Observed in French Guinea by M. Donnat" (Sur deux nématodes observés en Guinée française par M. Donnat). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 255-259.

The parasites noted are a nematode of the horse and a *Spirocerca* of the dog.

RÈNE, C. "Mange in Sheep" (Gale du mouton). *Progrès Agricole.* Vol. XXXI., No. 1528. 29th April 1917. P. 200.

RITCHIE, A. H. "Hog Lice." *Journ. Jamaica Agric. Soc.* Vol. XXI., No. 3. March 1917. Pp. 91-92.

The following mixtures are suggested for the destruction of lice on pigs :—
 Kerosene emulsion, 10 per cent.; Florida citrus spray, one part to five parts of water; half a pint of kerosene made into a creamy mass with 1 lb. of rancid grease, lard, or butter; tobacco decoctions; emulsion of Jeyes' soap and hot water. Or rubbing-post may be provided wrapped round with burlap saturated with crude oil.

ROURAUD, E. "Auto-inoculation and Primary Development, in the Buccal Mucous Membrane, of the Larvae of *Gastrophilus equi*" (Auto-inoculation et développement primaire, dans les muqueuses buccales, de la larve du Gastrophile équin (Estre du cheval)). *C. R. Acad. Sci.* Vol. CLXIV., No. 11. 12th March 1917. Pp. 453-456.

TUTT, J. F. D. "Some Notes on Skin Diseases of the Horse." *Vet. News.* Vol. XIV., No. 702. 16th June 1917. Pp. 240-243.

Parasitic mange, ringworm, and lice are considered. Paraffin emulsion has been found to give excellent results in the treatment of lice.

VAN SACEGHEM, R. "Dermatitis and Demodectic Mange of Bovines" (Dermatose et gale démodectique des bovidés). *Bull. Soc. Path. Exot.* Vol. X., No. 2. February 1917. Pp. 117-120.

VELU, H. "Trypanosomiasis of Horses in Morocco" (La trypanosomiase des chevaux au Maroc. Étude expérimentale). *Bull. Soc. Path. Exot.* Vol. X., No. 3. March 1917. Pp. 253-260.

— "Experimentation on the Method of Hérelle against *Schistocerca peregrina* Olivier" (Deuxième campagne d'expérimentation de la méthode d'Hérelle au Maroc contre *Schistocerca peregrina* Olivier). *Ann. Inst. Pasteur.* Vol. XXXI., No. 6. June 1917. Pp. 277-290.

VIGEL and CHOLLET. "Liépinay's Treatment of Mange of the Horse by Sulphurous Anhydride." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 267-276. 12 Figures.

YAKIMOFF, W. L. "Ticks of Domestic Animals in Russian Turkestan" (Les tiques des animaux domestiques du Turkestan russe). *Bull. Soc. Path. Exot.* Vol. X., No. 4. April 1917. Pp. 298-301.

The following ticks were found :—On horses, *Hyalomma aegyptium dromedarii* and *Rhipicephalus simus*; on cattle, *Hyalomma aegyptium aegyptium*, *Dermacentor reticulatus*, and *Margaropus annulatus calcaratus*; on camels, *Hyalomma aegyptium aegyptium*, *Hyalomma syriacum*, and *Margaropus annulatus calcaratus*; and on fowls, *Argas persicus*.

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YAKIMOFF, W. L., and OTHERS. "Microfilariae of Animals in Russian Turkestan" (Microfilaires des animaux au Turkestan russe). *Bull. Soc. Path. Exot.* Vol. X., No. 2. February 1917. Pp. 102-105.

Out of 597 dogs from various districts, microfilariae were found in 61. The parasites were identical with *Microfilaria immitis*. Occasionally adult filaria were found in the heart and the large blood-vessels.

The peripheral blood of 316 bovines showed no microfilariae. In another series of 1019 bovines the peripheral blood was found to contain the parasites in two animals. The livers of 510 animals were examined and parasites were found in forty-three cases. The parasite seems to be identical with the embryonic stage of *Filaria labiatopapillosa*.

The peripheral blood of 1173 sheep and 671 ewes and the livers of 106 sheep were examined, but no microfilariae were found.

— — — "Animal Diseases in Russian Turkestan due to Blood Parasites" (Maladies animales du Turkestan russe à parasites endoglobulaires). *Bull. Soc. Path. Exot.* Vol. X., No. 4. April 1917. 1Pp. 302-311.

Piroplasmosis occurs in cattle. The disease is caused in horses by *Piroplasma caballi* and *Nuttallia equi*. Trypan-blue gives good results. Sheep are more frequently affected by *Theileria* than by piroplasmosis. Piroplasmosis is common in wolves, but does not occur in dogs. *Theileria parva* causes both acute and chronic disease in cattle. *Theileria ovis* occurs in sheep, and *T. camelensis* (sp. n.) in camels. Nuttalliosis affects horses and donkeys, and can be treated with trypan-blue. *Anaplasma marginale* occurs in cattle, and along with *Nuttallia equi*, in horses. Occasionally it is found in dogs.

PATHOLOGY AND BACTERIOLOGY.

ADAMI, J. G. "Adaptation and Disease." *Brit. Med. Journ.* No. 2947. 23rd June 1917. Pp. 837-841. *Ibid.* No. 2948. 30th June 1917. Pp. 872-873. *Ibid.* No. 2949. 7th July 1917. Pp. 9-11.

Evidence supports the hypothesis that at some period or other pathogenic organisms have originated from those saprophytic on the body surface or existing in food-stuffs. Experiment can be devised whereby every member of a colony can be made to take on a new property. The experiment can be so arranged that there is no question of chance variation, of survival of those forms, and those forms only, which exhibit variation in a favourable direction; no question, that is, of survival of the fittest; but there is, within certain limits, direct adaptation in the Spencerian sense, direct equilibration between the organism and its environment. Similarly, experiment can produce loss of factors. It is also possible to modify the virulence and pathogenic properties of bacteria. And, further, it is possible by experiment to convert harmless non-pathogenic bacteria into highly pathogenic virulent forms.

BARILE, C. "Notes on Pathological Anatomy" (Appunti di anatomia patologica). *Il Nuovo Ercolani*. Vol. XXII., Nos. 13-14. 15th-31st July 1917. Pp. 211-217. *Ibid.* No. 15. 15th August 1917. Pp. 221-228. *Ibid.* No. 16. 31st August 1917. Pp. 237-243.

BLAIR, W. R., and BROOKS, H. "Osteomalacia or 'Cage Paralysis' in Primates." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 330-346.

The paper contains a detailed description of a condition of such frequency, particularly among the primates, that it forms one of the most serious obstacles to the maintenance of large and complete collections of wild animals in captivity. There is no doubt that it has long been confused with rachitis, but there is the clinical difference, that whereas rachitis is congenital "cage paralysis" is acquired.

BOQUET, A., and NÈGRE, L. "Cultivation of the Organism of Epizootic Lymphangitis" (Sur la culture du parasite de la lymphangite épidémiologique). *Bull. Soc. Path. Exot.* Vol. X., No. 4. April 1917. Pp. 274-276.

BROWNE, T. G. "Melanotic Sarcoma in a Mare." *Vet. News.* Vol. XIV., No. 703. 23rd June 1917. Pp. 250-251.

In an aged grey mare used for dissection purposes. The tumour was extensively distributed, the head and neck being the only portions of the body which were quite free. The lymphatic system was the most extensively involved, very few lymph-glands having escaped invasion.

CAPARINI, U. "Physiological Atrophy of the Liver and Aberrant Hepatic Vessels in Solipeds" (Sui l'atrofia fisiologica del fegato dei solipedi e sui vasi biliari aberranti). *Il Moderno Zooiatro.* Parte Sci. Ser. V., Vol. VI., No. 5. 31st May 1917. Pp. 109-126. 11 Text-Figures. 3 Coloured Plates (5 Figures).

For long, atrophy of the liver of old solipeds has been regarded as physiological. But the phenomenon is not constant, nor does it appear exclusively in the aged. The present author inclines to the opinion that it is due to an auto-intoxication of gastro-intestinal origin.

CROCKER, W. J. "Chronic Indurative Nephritis and its Relationship to Ascites in the Dog." *Cornell Veterinarian.* Vol. VII., No. 3. July 1917. Pp. 209-217.

FINZI, G. "Osteomalacia in a Young Monkey" (Paresi osteomalacica in una giovane scimmia e osteomalacia). *La Clinica Vet.* Vol. XI., No. 11. 15th June 1917. Pp. 301-314. 1 Figure.

A careful consideration of a case of osteomalacia as it occurred in a male *Macacus rhesus* about thirty months old.

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GORDON, H. "On the Nitrogenous Food Requirements of the Commoner Pathogenic Bacteria." *Journ. Roy. Army Med. Corps.* Vol. XXVIII., No. 3. March 1917. Pp. 371-376.

GROSSO, G. "The Lesions Produced by the Bacillus of Necrosis in Domestic Animals" (Le lesioni prodotte dal bacillo della necrosi negli animali domestici). *La Clinica Vet.* Vol. XL., No. 9. 15th May 1917. Pp. 241-250. *Ibid.* No. 10. 30th May 1917. Pp. 271-280.

This paper considers diphtheria of the calf, necrosis of the liver of lambs, and experimental and spontaneous necrosis of the rabbit.

KINSELLA, R. A., and SWIFT, H. A. "A Classification of Non-Hæmolytic Streptococci." *Journ. Exp. Med.* Vol. XXV., No. 6. June 1917. Pp. 877-896. 4 Tables.

"A classification of non-hæmolytic streptococci can be effected by studying the complement-fixation reactions between the streptococci and their antisera."

KRUTSKI, A. "Pathology of the Female Sexual Organs of Cattle" (Beiträge zur Pathologie der weiblichen Sexual-Organe des Rindes. III.) *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 8. August 1917. Pp. 430-465.

This forms part of a report of an elaborate investigation, and deals with chronic catarrhal endometritis in the cow.

LOPEZ, C. L. "The Action of Chloride of Sodium on the *Bacillus anthracis*" (Acción del cloruro sodico el *bacillus anthracis*). *Revista Hig. y Sanidad Pecuaria.* Vol. VII., No. 4. July 1917. Pp. 205-208.

A further contribution on this subject in supplement of a previous paper by the same author (see this *Review*, Vol. I. p. 146).

OZAKI, Y. "The Spleen as a Bacterial Filter." *Journ. Med. Res.* Vol. XXXVI., No. 3. July 1917. Pp. 413-422.

From experiments on the spleen of dogs the author concludes that the accumulation of bacteria in the organ, such as occurs in experimental bacteriæmia, is principally dependent upon the vital activity of the cells, and the mechanical filtration of bacteria by the spleen is not an important factor in their detention. From a mechanial standpoint the kidney may be regarded as a much more effective filter.

PETIT, G. "A Large Intracardiac Fibroma in a Cow" (Note sur un volumineux fibrome intracardiaque chez une vache). *Rev. Path. Comp.* Vol. XVII., No. 136. July 1917. Pp. 4-5.

A large fibroma occupied the whole of the right atrium (auricle) of the

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heart of an aged cow. The tumour was connected by a narrow and short pedicle, at the point where the posterior vena cava entered the heart. The author knows of no similar cases, save exceptional instances associated with cardiac melanosis in the horse.

PEYRON, A. "Suprarenal Paraganglioma" (Le paragangliome surrénal). *Ann. Inst. Pasteur.* Vol. XXXI, No. 7. July 1917. Pp. 313-367. 27 Figures.

RIVABELLA, S. "Contribution to the Diagnosis of Diseases of the Uterus" (Contributo alla diagnosi delle malattie dell' utero). *La Clinica Vet.* Vol. XL., No. 12. 30th June 1917. Pp. 337-365. *Ibid.* No. 13. 15th July 1917. Pp. 373-381.

Contains an account of the cytological examination of the uterine secretion of over one hundred cows.

VAN SACEGHEM, R. "Tumours in a Zebu Heifer" (Étude de tumeurs constatées sur une génisse de la race zebu). *Bull. Soc. Path. Exot.* Vol. X., No. 3. March 1917. Pp. 182-183.

Papillomatous growths appeared round the anus of a zebu heifer at Zambi. The growths spread to the vulva, the tail, the teats, and the limbs, and finally caused death by invading the right auditory canal. The tumours were contagious for the animal itself.

PHARMACOLOGY AND THERAPEUTICS.

BORDIER, H., and ROY, G. "The Colloidal State of Camphor in Camphorated Oil and Water" (État colloidal du camphre dans l'eau en présence de l'huile camphrée. Conséquences biologiques et thérapeutiques). *C. R. Acad. Sci.* Vol. CLXIV., No. 17. 23rd April 1917. Pp. 648-650.

The authors think that the remarkable therapeutic action of camphorated oil when injected under the skin is due in great part to the physical state in which the blood brings the camphor into contact with the tissues and organs, and the nervous system and heart in particular.

MACHT, I. I. "On the Pharmacology of the Ureter. V. Action of Nitrates and Nitrites." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 8. May 1917. Pp. 427-430. 3 Figures.

Experiments on the ureter of the pig show that nitrates are slightly stimulating and not toxic, while nitrites are rapidly toxic and paralysing in their action.

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MACHT, D. I. "On the Comparative Effects of the Opium Alkaloids Individually and in Combination with Each Other on the Gall Bladder." *Journ. Pharmacol. and Exp. Therap.* Vol. IX., No. 8. May 1917. Pp. 473-481. 10 Figures.

Observations on the dog and cat lead to the following conclusions:—Morphin, codein, and thebain have either no appreciable effect upon the tonus and contractions of the gall bladder or tend to stimulate them. Papaverin, narcotin, and narcein tend to inhibit the contractions and to decrease the tonus. In a combination of total alkaloids the benzylisoquinoline effect on the smooth muscle predominates. Atropin, in small or therapeutic doses, does not relax the tonus.

MALONE, P. J. "Chloral Intravenously as an Anæsthetic." *Vet. Record.* Vol. XXIX., No. 1511. 23rd June 1917. Pp. 531-532.

The writer has found that in most cases 2 ozs. are sufficient, and now uses this as his standard dose. "In nine cases out of ten the animal drops in his tracks; anesthesia is immediate and sufficient for such operations as quittors, fistulous withers, castrations, rigs, the roaring operation, etc."

ROWLETTE, R. J. "Reflections on the Limitations of Vaccine Treatment." *Lancet.* Vol. CXCII., No. 4896. 30th June 1917. Pp. 984-985.

In every branch of medicine there is difficulty in estimating therapeutic results, but in the case of vaccines the difficulty has been increased by certain more or less accidental circumstances. Vaccine treatment must become familiar to every practitioner, and will thus take its place as an essential part of the treatment of infective disorders of bacterial origin.

STROUD, E. L. "Colloidal Remedies." *Vet. News.* Vol. XIV., No. 704. 30th June 1917. Pp. 261-263.

Calling attention to the value of the Crookes' Laboratories "Collosol" preparations.

WALTERS, A. L., and KOCH, E. W. "Pharmacological Studies of the Ipecac Alkaloids and some Synthetic Derivatives of Cephaeline. I. Studies on Toxicity." *Journ. Pharmacol. and Exp. Therap.* Vol. X., No. 1. July 1917. Pp. 73-81.

Emetin is not a very toxic alkaloid when given in a single dose, but it is dangerous when given repeatedly in small doses over a considerable period of time.

PHYSIOLOGY.

HAMMOND, J., and HAWK, J. C. "Studies in Milk Secretion. I. The Effect of Nutrition on Yield and Composition. II. The Relation of the Glands of Internal Secretion to Milk Production." *Journ. Agric. Sci.* Vol. VIII., Part 2. March 1917. Pp. 139-153. 2 Figures, 8 Tables.

HILL, R. L. "Some Aspects of the Physiology of Mammary Secretion." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 642-654. 8 Tables.

ROUS, P., and ROBERTSON, O. H. "The Normal Fate of Erythrocytes. I. The Findings in Healthy Animals. II. Blood Destruction in Plethoric Animals and in Animals with a Simple Anaemia." *Journ. Exp. Med.* Vol. XXV., No. 5. May 1917. Pp. 651-673. 2 Plates (6 Figures).

The phagocytosis of red blood-corpuscles, while frequent in the normal dog, rat, and guinea-pig, is slight in man, the *Rhesus* monkey, and many rabbits. In cats it is always negligible in amount and frequently absent. "The normal fate of the red corpuscles, in those species in which phagocytosis is negligible, is to be fragmented one by one, while still circulating, to a fine haemoglobin-containing dust. The cell fragments are rapidly removed from the blood, but their ultimate fate remains to be determined."

POULTRY DISEASES.

KAUPP, B. F. "Acute Hepatitis and Nephritis of the Hen." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 421-424. 2 Figures.

Two cases of acute hepatitis and nephritis, both in association with each other, were studied in two single-comb white Leghorn hens. The livers and kidneys were greatly enlarged. The outer surface of the organs in cases of acute hepatitis and acute nephritis presents a mottled whitish appearance.

— "Fibrinous Enteritis in a Hen." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 562-564. 2 Figures.

The fibrinous enteritis was apparently due to coarse, rough material finding its way into the intestine as the result of mechanical interference (impaction with woody grass and hay) of the function of the gizzard.

PICKENS, E. M. "Some of the Infectious Diseases of Poultry." *Cornell Veterinarian.* Vol. VII., No. 3. July 1917. Pp. 151-184.

Roup, contagious epithelioma, coccidiosis, infectious entero-hepatitis, favus, aspergillosis, fowl typhoid, bacillary white diarrhoea, fowl cholera, and avian tuberculosis are briefly considered. Lists of references are given.

BIBLIOGRAPHY—SEROLOGY AND IMMUNOLOGY 467

WARD, A. R., and GALLAGHER, B. A. "An Intradermal Test for *Bacterium pullorum* Infection in Fowls." *Bull. No. 517.* Professional Paper. U. S. Dept. Agric. 16th February 1917. P. 15. 9 Tables.

SEROLOGY AND IMMUNOLOGY.

BAYNE-JONES, S. "Equilibria in Precipitin Reactions. The Co-existence of a Single Free Antigen and its Antibody in the Same Serum." *Journ. Exp. Med.* Vol. XXV., No. 6. June 1917. Pp. 837-853. 1 Graph, 2 Tables.

BIRCH, R. R. "A Serum Test Influenced by Ascaris Infestation." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 5. August 1917. Pp. 694-696.

"Because the infested pigs receiving the lighter doses of serum died, while pigs free from parasites but receiving the same doses of serum and virus showed no symptoms, it seems reasonable to suppose that the worms were responsible for the difference in results."

BUXTON, J. B. "The Temperature Required for the 'Inactivation' of Mule Blood for the Complement-Fixation Test for Glanders." *Vet. Journ.* Vol. LXXIII., No. 7. July 1917. Pp. 245-247.

This note is published because no reference is made in current literature to a peculiarity in the blood of the mule.

"It was found that while an exposure of ten minutes to 62° C. failed to completely inactivate the serum of a non-glandered mule, there being incomplete haemolysis, as shown by a faint haziness, with quantities of 0·2 and 0·1 c.c. of serum respectively, an exposure of fifteen minutes at the same temperature was sufficient to produce complete haemolysis with all dilutions."

COURMONT, J., and ROCHAIX, A. "The Effect of Antityphoid Vaccination on the Blood of the Dog" (*Études expérimentales sur la vaccination antityphoïdique (Vaccin mixte TAB)*). *Ann. Inst. Pasteur.* Vol. XXXI., No. 4. April 1917. Pp. 187-208. 10 Charts, 5 Tables.

Antityphoid vaccination of dogs produces immediate leucopenia, then hyperleucocytosis (neutrophile polynuclear leucocytosis with very slight neutrophile myelocytosis), followed by leucopenia with lymphocytosis.

CREMONA, P. "The Intrapalpebral Reaction in Experimental Tuberculosis of the Horse and in Bovine Tuberculosis" (*L'intrapalpebro reazione alla tubercolina nella tubercolosi sperimentale del cavallo e nella tubercolosi dei bovini*). *Il Nuovo Ercolani.* Vol. XXII., No. 12. 30th June 1917. Pp. 189-194. 1 Figure.

EICHHORN, A. "Blackleg Filtrate." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 406-413. *Amer. Journ. Vet. Med.* Vol. XII., No. 6. June 1917. Pp. 375-378.

KERNKAMP, H. C. H. "Summary of Observations on 1470 Hogs Hyper-immune to Hog Cholera." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 537-540.

KONRADÍ, D. "Hereditary Immunity to Rabies" (Die Vererbung der Immunität gegen Lyssa). *Centralbl. f. Bakteriol., I., Orig.* Vol. LXXIX., No. 1. 30th January 1917. Pp. 80-82.

Konrádi has already concluded that immunity to rabies is transmissible to the offspring, and that it is chiefly the mother which has the power of such transmission. He has also previously stated that the duration of the immunity is six months. New evidence now causes him to extend the duration of immunity to eight months and twenty-five days.

— "Hereditary Transmission of Rabies" (Die Vererbung der Wut). *Centralbl. f. Bakteriol., I., Orig.* Vol. LXXIX., No. 1. 30th January 1917. Pp. 82-84.

A bitch which had recovered from the effects of the subcutaneous injection of rabies virus gave birth to four pups. These lived from fourteen to thirty-four days, and on post-mortem examination Negri bodies were demonstrated.

In another instance the injection of emulsions of the organs of pups into guinea-pigs produced typical rabies.

NOVY, F. G., DE KRUIF, P. H., NOVY, R. L., and GERMAN, W. M. "Anaphylatoxin and Anaphylaxis. I. Trypanosome Anaphylatoxin. II. Agar Anaphylatoxin: Guinea-pig Serum. III. Agar Anaphylatoxin: Rabbit Serum. IV. Agar Anaphylatoxin: Rat Serum. V. Effect of Multiple Doses of Anaphylatoxin. VI. Effect of Intravenous Injections of Agar." *Journ. Inf. Dis.* Vol. XX., No. 5. May 1917. Pp. 499-656. "VII. Peptone Anaphylatoxin. VIII. The Primary Toxicity of Normal Serum. IX. Specific Anaphylactic Shock. X. Anaphylatoxin and Amino-Nitrogen." *Ibid.* No. 6. June 1917. Pp. 657-854. 18 Charts, 161 Tables.

This series of papers deals with an elaborate investigation on anaphylaxis, and should be consulted in the original.

PAPPENHEIM, A. M. "Experimental Studies upon Lymphocytes. II. The Action of Immune Sera upon Lymphocytes and Small Thymus Cells." *Journ. Exp. Med.* Vol. XXVI., No. 2. August 1917. Pp. 163-179. 1 Plate (4 Figures). 6 Text-Figures.

"Experiments indicate that the lymphotoxic and agglutinative factors are to a considerable degree distinct from the haemolytic and haemagglutinative ones, since they are separated from one another by absorption."

SCHAFFTER, C. "The Influence of Subcutaneous Malleination on Conglutination" (Der Einfluss der subkutanen Malleinimpfung auf den Ausfall der Konglutination). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 6. June 1917. Pp. 313-335.

WHITING, R. A. "The Virulence of Hog-Cholera Blood at Different Periods during the Disease." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 477-493. 12 Tables.

With a view to determining the best time at which to take serum, and if possible to ensure an increase in the potency of the final antiserum, the author has conducted a series of observations which seem to point to the conclusion that "there is a gradual increase in the virulence of the blood as the disease progresses from four to eight days following inoculation, and that the eight-day blood was the most virulent. In producing virus for serum production one may be justified in killing such hogs, beginning six days following inoculation, provided there is a corresponding high temperature and a manifestation of symptoms, especially weakness."

SURGERY.

BODIN. "Treatment of Sores of the Back" (Traitement des plaies du dos). *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 304. 15th April 1917. Pp. 136-137.

BOGUE, T. G. S. "Treatment of Ulcerative Cellulitis with Pieric Acid." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 288-290.

Captain Bogue has found a 1 per cent. aqueous solution of pieric acid to give most satisfactory results.

BOISSIÈRE. "Dislocation of the Mandibular Symphysis in a Foal" (Dislocation de la symphyse maxillaire chez un poulain). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 263-264.

The result of an accident in a foal one year old. The two halves of the mandible were retained in position by brass wire placed round the incisor teeth, engaging in small notches made by a file in the corner teeth. The wire was renewed four times in the course of fifteen days, at the end of which time it was finally removed. Three weeks after the accident the foal began to take solid food.

BOND, C. J. "Acriflavine Paste as a Dressing for Infected Wounds." *Brit. Med. Journ.* No. 2949. 7th July 1917. Pp. 6-7.

BRINGARD. "New Treatment of Wounds in the Larger Domestic Animals" (Traitement nouveau des plaies chez le cheval et nos grands animaux domestiques). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 259-263.

BROON, T. F. "The Use of Pieric Acid in War Surgery." *Journ. Roy. Army Med. Corps.* Vol. XXVIII., No. 6. June 1917. Pp. 722-724.

The value of a 1 per cent. solution of pieric acid in the treatment of wounds is indicated.

BROWNING, C. H., GULBRANSEN, R., and THORNTON, L. H. D. "The Antiseptic Properties of Acriflavine and Proflavine, and Brilliant Green." *Brit. Med. Journ.* No 2951. 21st July 1917. Pp. 70-75. 2 Tables, 2 Graphs.

CAMPBELL, H. C. "New Treatment for Wounds and Burns." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 554-556.

CARREL, A., and HARTMANN, ALICE. "Cicatrisation of Wounds. VIII. Sterilisation of Wounds with Chloramin-T." *Journ. Exp. Med.* Vol. XXVI., No. 1. July 1917. Pp. 95-118. 20 Charts.

Under experimental conditions, chloramin paste maintains the asepsis of a wound already sterile, and sterilises an infected wound.

CARREL, A., DU NOUY, P. L., and CARREL, ANNE. "Cicatrisation of Wounds. IX. Influence on the Healing of Wounds of Variations in the Osmotic Tension of the Dressing." *Journ. Exp. Med.* Vol. XXVI., No. 2. August 1917. Pp. 279-295. 6 Figures.

"The flushing of an aseptic granulating wound with hypertonic sodium chloride solution or distilled water brings about an immediate reinfection. Distilled water and hypertonic sodium chloride solution do not modify to a measurable extent the rate of healing of an aseptic wound."

CHAPRON, H. "Some War Wounds in the Horse" (Quelques blessures de guerre chez le cheval). *Rec. Méd. Vét.* Vol. XCIII., No. 13. Pp. 347-355.

Records fifteen cases met with by the author.

CHAUSSÉE. "A New Metallic Bandage for Wounds" (De l'emploi d'un nouveau pansement dit "métallique"). *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 305. 15th May 1917. Pp. 177-181. 5 Figures.

As cotton bandages have been found very unsatisfactory on active service, bandages made of wire-netting, with as fine a mesh as possible, have been used, and are herein recommended.

DAUFRESNE, M. "Cicatrisation of Wounds. VII. The Use of Chloramin-T Paste for the Sterilisation of Wounds." *Journ. Exp. Med.* Vol. XXVI., No. 1. July 1917. Pp. 91-93.

Dakin's toluene sodium *p*-sulfochloramide, mixed with sodium stearate, forms a paste sufficiently active and stable to be used in the treatment of wounds.

FIESSINGER, N., and CLOGNE, R. "The Antiseptic Action of the Alkaline Hypochlorites, and particularly of the Dakin-Daufresne Solution" (*L'action antiseptique des hypochlorites alcalins et en particulier de la solution de Dakin-Daufresne*). *C. R. Soc. Biol.* Vol. LXXX., No. 13. 30th June 1917. Pp. 633-634.

Hypochlorite of sodium in the form of Dakin's fluid is a very feeble antiseptic. The good results obtained by irrigation of wounds depends upon the strong proteolytic action of the hypochlorites.

FLEMING, A. "The Physiological and Antiseptic Action of Flavine." *Lancet*. Vol. CXCIII., No. 4905. 1st September 1917. Pp. 341-345. 2 Figures, 4 Tables.

FLURET. "A New Operation for 'Quittor'" (*Nouveau manuel opératoire du javart cartilagineux*). *Rec. Méd. Vét.* Vol. XCIII., No. 13. 15th July 1917. Pp. 338-343. 5 Figures.

GATES, F. L. "A Valve to Regulate the Delivery of Air and Ether Vapour in any Proportion." *Journ. Exp. Med.* Vol. XXVI., No. 1. July 1917. Pp. 41-48. 6 Figures.

"A valve is described for the control of ether vapour for anaesthesia which regulates the mixture of ether vapour from a Woulfe bottle with air in any proportion, without changing the volume or the pressure at which the mixture is delivered. The regulation of the air-stream both to and from the ether bottle controls the mixture accurately and is an essential feature of the valve."

GORE-GILLON, G., and HEWLETT, R. T. "Acetozone as a General Surgical Antiseptic." *Brit. Med. Journ.* No. 2955. 18th August 1917. Pp. 209-210.

Lieut.-Col. Gore-Gillon has "seen numerous cases of septic wounds which have resisted all other treatment for four or five months heal up in three weeks by this method."

GORIS, A., and ROLLAND, P. "The Resorption of Catgut" (*Sur la résorption du catgut*). *Ann. Inst. Pasteur.* Vol. XXXI., No. 6. June 1917. Pp. 269-276. 1 Text-Figure, 3 Plates (16 Figures).

GRAY, H. "Luxation of the Lens." *Vet. Record.* Vol. XXX., No. 1514. 14th July 1917. Pp. 13-14.

In some cases of luxated lens the writer has found the lens, after extraction, to be dense and hard; and although it may be greyish, it is never opaque, as in complete cataract. The lens always appears to be larger when in one of the chambers of the eye than it really is, on account of the magnification produced by the cornea.

— "Occlusion of the Conjunctival Sacs and the Palpebral Fissure after Excision of the Eyeball." *Vet. Record.* Vol. XXX., No. 1515. 21st July 1917. Pp. 25-26.

For complete success in the operation described by Gray, "the whole of the conjunctival mucous membrane and of the free margins of the eyelids and also the lacrimal gland and membrana nictitans must be removed."

GUYON, CH. "The Williams Operation for 'Roaring'" (Note sur l'opération de Williams). *Rev. Gén. Méd. Vét.* Vol. XXVI., No. 304. 15th April 1917. Pp. 129-136. 1 Table.

HAAS. "Treatment of 'Quittor'" (Du traitement du javart cartilagineux par l'amincisement du bourrelet et de la paroi et le passage dans la fistule d'une mèche imprégnée de vésicatoire). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 5th July 1917. Pp. 272-274.

HAMOIR, J. "Fissure and Secondary Fracture of the Metacarpus by a Shrapnel Bullet" (Fêlure et fracture secondaire du canon par balle de shrapnell). *Rec. Vét. Méd.* Vol. XCIII., No. 13. 15th July 1917. Pp. 343-347. 2 Figures.

This is the record of a case in which a shrapnel bullet of low velocity caused extensive fission of the metacarpal bone, which some days later was converted into fracture during the act of lying down.

HENRY, H. "On Some Anaerobes found in Wounds, and their Mode of Action in the Tissues." *Brit. Med. Journ.* No. 2946. 16th June 1917. Pp. 806-808. 2 Tables.

Anaerobic organisms isolated from wounds may be divided into saccharolytic and proteolytic, which act in this order.

HODGKINS, J. R. "A Poll-Evil Bridle." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. P. 285. 2 Figures.

JAMES, V. C. "Notes on the Use of Flavine as an Antiseptic." *Journ. Roy. Army Med. Corps.* Vol. XXVIII., No. 3. March 1917. Pp. 392-395.

JONES, R. "Fracture of the Tibia." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. P. 205.

A case of fracture without displacement in which the subject, a three-year-old draught filly, worked in the plough for a whole day after the injury.

— "Castrating Rope." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. Pp. 211-212. 2 Figures.

MARCO, F. "Two Cases of Resection of the Body of the Mandible" (Due casi di resezione dei corpo del mascellare). *Il Moderno Zootro.* Parte Sci. Ser. V., Vol. VI., No. 4. 30th April 1917. Pp. 105-107.

MAYLARD, A. E. "The Value of Pure Carbolic Acid in the Treatment of Septic Wounds." *Brit. Med. Journ.* No. 2946. 16th June 1917. P. 808.

"To soak all necrotic tissue in pure carbolic acid is to effect complete sterilisation. . . . Wounds so treated rapidly 'clean up'; any advance of the acute septic process in the immediate neighbourhood of the necrotic tissue ceases; pain in the part is relieved; the temperature often falls, and in every way the patient generally, and the part locally, show signs of rapid improvement."

MENSA, A. "The Result of a Foot-Injury in the Horse" (Di un cheravillocele coronario ascendente nel cavallo). *Il Nuovo Ercolani.* Vol. XXII., No. 11. 15th June 1917. Pp. 173-178. 1 Figure.

— "Surgical Intervention in Polypi of the Nose and Throat of the Horse" (Sugli interventi radicali nelle poliposi naso-gutturo-fronto-mascellari degli equidi). *Il Nuovo Ercolani.* Vol. XXII., No. 12. 30th June 1917. Pp. 194-198. *Ibid.* Nos. 13-14. 15th-31st July 1917. Pp. 205-210. 5 Figures.

MOREAU, D., and GENTET. "Complete Fracture of the Incisive Bone (Premaxilla)" (Fracture complète de l'intermaxillaire). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 150-152.

Two metallic sutures were inserted. The case terminated favourably.

PALMAN, A. "The Treatment of Convex Sole" (Om botandet av fullhov). *Svensk Veterinaertidskr.* Vol. XXII., No. 5. May 1917. Pp. 165-175. 9 Figures.

ROUTLEDGE, A. R. "Treatment of Serous Abscesses on the Side of the Neck and Shoulders, Resulting from Bites." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 286-287. 8 Figures.

ROUTLEDGE, A. R. "Treatment of Grease." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. P. 287.

SWEET, J. E. "Dakin's 'Dichloramin-T' in the Treatment of the Wounds of War." *Brit. Med. Journ.* No. 2956. 25th August 1917. Pp. 249-250.

"The new 'dichloramin' solution is made by dissolving the crystals of 'dichloramin-T' in chlorinated eucalyptol and then diluting this solution by the addition of chlorinated paraffin oil. It is best applied by an oil spray, an ordinary hard rubber or all-glass atomiser being the most practical method." Dressings do not stick to granulations. The amount of solution needed is of small bulk. There is saving of dressing material and time.

TAYLOR, W. "Unusual Result after the 'Roaring' Operation." *Vet. Journ.* Vol. LXXIII., No. 8. August 1917. Pp. 290-291. 2 Figures.

The usual operation of stripping the ventricle was performed. A tumour the size of a hen's egg developed at the point of incision.

THEIS. "The Utilisation of Peat" (Note sur l'utilisation de la tourbe). *Rec. Méd. Vét.* Vol. XCII. Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 139-141.

The writer speaks in high terms of the value of peat as a dressing for wounds, applied either in the fibrous form or as a powder.

VINCENT, A. "Cicatrisation of Wounds. VI. Bacteriological Asepsis of a Wound." *Journ. Exp. Med.* Vol. XXVI., No. 1. July 1917. Pp. 83-89. 5 Tables.

It is shown that, in general, 35 per cent. of cases treated with Dakin's solution or chloramin paste become bacteriologically aseptic. This degree of asepsis is not necessary in order to suture the wound, the absence of bacteria in films being sufficient. Complete sterilisation of wounds can, therefore, now be accomplished.

WEBB, C. H. S. "A Note on the Value of Brilliant Green as an Antiseptic." *Brit. Med. Journ.* No. 2948. 30th June 1917. P. 870.

Brilliant green is an active, efficient, and non-irritant antiseptic which acts in the presence of serum and possesses very definite "auxetic" properties. It stains dead tissue green, and so may aid the surgeon in determining what to excise. It is soluble in "saline."

WRIGHT, ALMROTH E. "The Treatment of War Wounds." *Lancet.* Vol. CXCII., No. 4895. 23rd June 1917. Pp. 939-949. 16 Figures.

The natural defence of the body against organisms depends upon two factors—leucocytes and serum. From experiments detailed, it appears that

it is the antitryptic action of the serum which enables it to inhibit the growth of organisms. Sir Almroth Wright divides septic wounds into "live spaces" and "dead spaces." In the former the tissues are well supplied with blood, there is a free supply of antibacterial lymph, and the ground is favourable for phagocytic action. In a "dead space" the tissues have been injured and the blood-supply cut off; leucocytes and serum being thus placed under a disadvantage. An infected dead space must be thoroughly drained. Every part of a wound which would become a dead space must be laid open.

WYSSMANN, E. "The Influence of the Coagulation Factor on Ovarian Haemorrhage" (*Über den Einfluss gerinnungshemmender Faktoren auf die Ovarialblutungen*). *Schweizer Arch. f. Tierheilk.* Vol. LIX., No. 7. July 1917. Pp. 393-404.

The writer thinks that those cases of fatal haemorrhage which sometimes follow surgical expression of the corpus luteum may be due to alteration in the coagulation value of the blood. Such accidents often occur in animals the subjects of pulmonary tuberculosis or distomatosis.

TERATOLOGY.

ALDIGÈ. "Abnormalities of the Horns of Bovines in French West Africa" (*Sur les anomalies de l'encornage des bovidés de l'Afrique occidentale française*). *Rec. Méd. Vét.* Vol. XCII., No. 14. 30th July 1917. *Bull. Soc. Centr. Méd. Vét.* 19th July 1917. Pp. 278-284.

BELLEVAL. "Asymmetry of the Hip in the Horse" (*Asymétrie du coxal chez le cheval*). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 3rd May 1917. Pp. 188-190. 1 Figure.

A deformity of the pelvis due to an incurving, forwards and downwards, of the sciatic tuber. The author believes that the deformity is produced at the time of parturition.

HAYWOOD, C. "An Interesting Case of Spurious Hermaphroditism." *Vet. Journ.* Vol. LXXIII., No. 6. June 1917. P. 206. 2 Figures.

A male simulating a female in external genitalia.

TOXICOLOGY.

CURTIS, R. S., and WOLF, F. A. "*Eupatorium ageratoides*, the Cause of Trembles." *Journ. Agric. Res.* Vol. IX., No. 11. 11th June 1917. Pp. 397-404. 3 Plates (5 Figures).

HACKETT, W. "Poisoning of Cattle with Horse-Radish." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. P. 138.

Three cows died. The tongue was swollen and hanging out of the mouth, and there was "a large patch of inflammatory congestion on the mucous membrane of the rumen" in each of the animals.

MARSH, C. D. "Potassium Permanganate as an Antidote for the Effects of Poisonous Plants." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 3. June 1917. Pp. 419-420.

Potassium permanganate is useless as an antidote in ruminants, unless it can be given repeatedly at short intervals (once every thirty minutes or less), so that it may attack the poisonous substance as it passes through the abomasum.

MÉRY, H., and MILLION. "The Toxicity of Emetin" (Recherches expérimentales sur la toxicité du chlorhydrate d'émétine). *C. R. Soc. Biol.* Vol. LXXX., No. 12. 16th June 1917. Pp. 592-594.

The importance of the recognition of toxicity by accumulation is pointed out. The study of the elimination of emetin with the urine has shown the importance of this accumulation.

MOREL, P. "Effects of Eating *Urtica dioica*" (Accidents causés par l'urtica dioica). *Rec. Méd. Vét.* Vol. XCII., Nos. 9-10. 30th April-30th May 1917. *Bull. Soc. Centr. Méd. Vét.* 5th April 1917. Pp. 148-149.

This note shows that, in addition to the production of local lesions of the skin and mucous membranes, *Urtica dioica*, when ingested, may produce general systemic disturbance in certain horses particularly susceptible.

STOCKMAN, S. "Poisoning of Cattle with British Ragwort." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 2. June 1917. Pp. 131-134.

TUBERCULOSIS.

CHAMBERS, F. "Tuberculosis in the Horse." *Vet. Journ.* Vol. LXXIII., No. 7. July 1917. Pp. 242-243.

Relates the occurrence of four cases of tuberculosis in the horse. In one case the mesenteric glands, pleura, and pericardium were affected. In the other three the lesions were purely abdominal.

HEWETSON, W. T. "Tuberculin." *Vet. Record.* Vol. XXX., No. 1518. 11th August 1917. Pp. 61-62.

The writer of this note is convinced that British and French tuberculins do not always give the same reaction. He is not in a position to say that

Pasteur tuberculin gives the correct diagnosis, but he feels disposed to say that it gives an action in some cases where other tuberculins fail to do so.

KINSLEY, A. T. "Tuberculin Testing." *Journ. Amer. Vet. Med. Assoc.* Vol. LI., No. 4. July 1917. Pp. 532-537.

"Unless radical changes are made in the testing done by the general practitioner, it seems probable that the future tuberculin testing will all be done under the direct supervision of Government and State officials."

KRAUSE, A. K. "The Nature of Resistance to Tuberculosis." *Bull. Johns Hopkins Hosp.* Vol. XXVIII., No. 316. June 1917. Pp. 191-198.

As a rule we can affirm that it is the bacillus that is the constant and the animal that is the variable. Taking the same emulsion of the same bacillus and using the same dose to inject a series of animals, if the animals are normal the same early result—focal tuberculosis—is always obtained. But if the animals are already tuberculous, then almost every variety of lesion is likely to occur, and the type of lesion will depend on two factors—on the number of micro-organisms brought to bear at any one point, and the degree of hypersensitiveness or overaction of the tissue at this point.

M'FADYAN, J. "Tuberculous Mastitis in the Cow: Its Pathogenesis and Morbid Anatomy and Histology." *Journ. Comp. Path. and Therap.* Vol. XXX., Part 1. March 1917. Pp. 57-77. *Ibid.*, Part 2. June 1917. Pp. 139-172. 39 Figures, 2 Plates.

McGRATH, J. J. "The Experimental Production of Tuberculous Peritonitis in Guinea-Pigs previously exposed to X-Rays." *Lancet.* Vol. CXCII., No. 4893. 9th June 1917. Pp. 875-876. 4 Tables.

MOHLER, J. R., and WASHBURN, H. J. "Tuberculosis of Hogs." *Farmers' Bull.*, No. 781. U.S. Dept. Agric. February 1917. P. 19. 3 Figures.

Tuberculosis occurs among pigs in the United States to a serious extent and appears to be increasing. Nine per cent. of all pigs slaughtered under Government meat inspection during the fiscal year 1916 were found to be affected in some degree. Tuberculous cattle are the main source of tuberculosis in pigs. The disease is most commonly conveyed by feeding pigs on unpasteurised skim milk and by allowing them to follow tuberculous cattle into the feeding-place and there feed on the undigested grain in the droppings.

RAVETLLAT, J. "A New Pathogeny of Tuberculosis" (Ensayo de una nueva patogenia de la tuberculosis). *Revista Hig. y Sanidad Pecuar.* Vol. VII., No. 3. June 1917. Pp. 137-160.

The new bacteriology of tuberculosis recognises three types of bacillus, which are convertible the one into the other. Type A represents the saprophytic form of the bacillus of Koch, does not contain fatty acids, and

has no capsule. Type B, the corpuscle of Much, is intermediate between type A and the bacillus of Koch, contains a certain amount of fatty acids, and possesses the first step towards the formation of a capsule. Type C is the bacillus of Koch.

ROCHAIX, A. "Avian Tuberle Bacillus" (Sur un préposé caractère différentiel du bacille tuberculeux avaire). *C. R. Soc. Biol.* Vol. LXXX., No. 12. 16th June 1917. Pp. 570-571.

Ranjel and Moraes (Vantagens de um novo meio vegetal de cultura, *A Patologia Geral*, August 1916) have asserted that the avian type of tubercle bacillus liquefies agar to which the juice of carrots has been added, while the human and bovine types do not. Rochaix has made observations on this point, and concludes that liquefaction is not general and cannot be held of value in differentiation.

SMITH, R. M. "The Danger to Children from Tuberculosis in Cattle." *Amer. Journ. Vet. Med.* Vol. XII., No. 7. July 1917. Pp. 441-444.

In New York City between 6 and 10 per cent. of the children that die in hospitals each year of tuberculosis die of the bovine type of the disease. The percentage of cases of bone tuberculosis due to bovine infection varies very much according to the age of the patient. In a series of sixty-seven cases 70 per cent. were of bovine origin. All the cases under one year of age were of bovine origin, and at least 78 per cent. of the cases under four years.

UDALL, D. H. "Control of Tuberculosis in the Herd." *Cornell Veterinarian.* Vol. VII., No. 3. July 1917. Pp. 200-209.

In the diagnosis of tuberculosis by the use of tuberculin in an experimental herd at the New York State Veterinary College the average percentage of failures for a period of six years was about twenty-five; that is, about 25 per cent. of animals known to be tuberculous failed to react.

WARREN, J. H. "Observations on the Formation of Giant Cells in Tuberculosis." *Journ. Med. Res.* Vol. XXXVI., No. 2. May 1917. Pp. 225-230. 1 Plate (3 Figures).

The present investigation has been based on the conviction of the specificity of the silver impregnation method for reticular fibres. The demonstration of reticular fibres in the cytoplasm of the so-called epithelioid or endothelioid cells of tuberculosis identifies them as of reticular tissue origin.

"The presence of fibrils in the cytoplasm, the similar morphological characteristics of the nuclei, the absence of nuclear divisions, and in some cases the existence of partial cell walls occurring in the smaller giant cells would seem to indicate that they are the result of a fusion of cells of reticular tissue origin."

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